OM-217 454Q
2010–07

Processes

Stick (SMAW) Welding

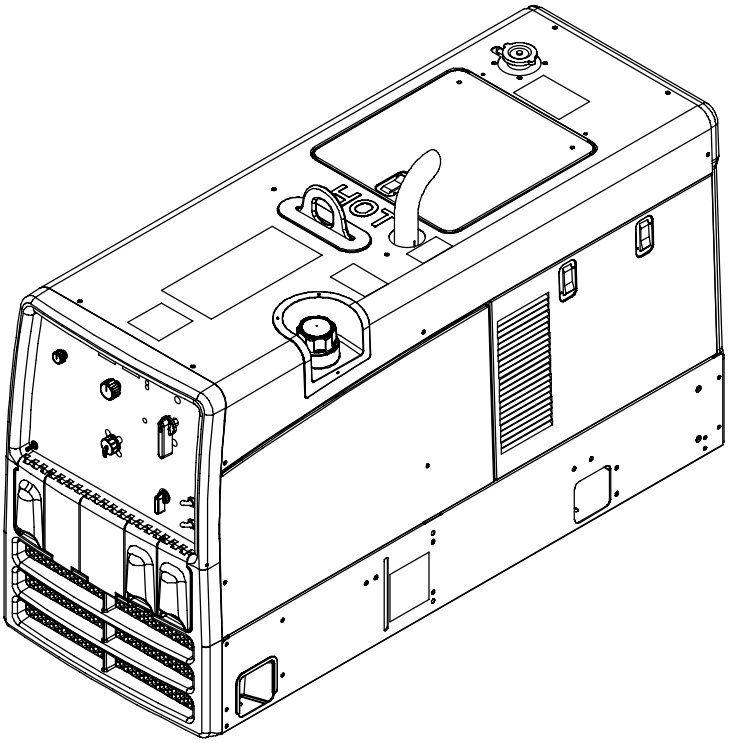
MIG (GMAW) Welding
Flux Cored (FCAW) Welding

AC/DC TIG (GTAW) Welding

Description

Engine Driven Welding Generator

Trailblazer® 302 Diesel



OWNER'S MANUAL

File: Engine Drive

Visit our website at
www.MillerWelds.com

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite.

ISO 9001 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide the exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual specification sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**

TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller®

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COMPLETE PARTS LIST - www.MillerWelds.com
WARRANTY

SECTION 1 – SAFETY PRECAUTIONS – READ BEFORE USING

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Protect yourself and others from injury — read, follow, and save these important safety precautions and operating instructions.

1-1. Symbol Usage

DANGER! – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

NOTICE *– Indicates statements not related to personal injury.*

☞ *Indicates special instructions.*

This group of symbols means Warning! Watch Out! ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-8. Read and follow all Safety Standards.

Only qualified persons should install, operate, maintain, and repair this unit.

During operation, keep everybody, especially children, away.

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

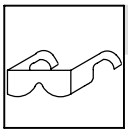
- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground — check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cord for damage or bare wiring — replace cord immediately if damaged — bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists in inverter power sources AFTER stopping engine.

- Stop engine on inverter and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

HOT PARTS can burn.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



FLYING METAL or DIRT can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes from arc rays and sparks when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare, and sparks; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton, or wool) and foot protection.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Use only correct fuses or circuit breakers. Do not oversize or bypass them.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

ELECTRIC AND MAGNETIC FIELDS (EMF) can affect Implanted Medical Devices.

- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder — explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

1-3. Engine Hazards

BATTERY EXPLOSION can injure.

- Always wear a face shield, rubber gloves, and protective clothing when working on a battery.
- Stop engine before disconnecting or connecting battery cables, battery charging cables (if applicable), or servicing battery.
- Do not allow tools to cause sparks when working on a battery.
- Do not use welder to charge batteries or jump start vehicles unless the unit has a battery charging feature designed for this purpose.
- Observe correct polarity (+ and –) on batteries.
- Disconnect negative (–) cable first and connect it last.
- Keep sparks, flames, cigarettes, and other ignition sources away from batteries. Batteries produce explosive gases during normal operation and when being charged.
- Follow battery manufacturer's instructions when working on or near a battery.

BATTERY CHARGING OUTPUT can injure.

(Battery charging feature not present on all models.)

- Have only qualified persons do battery charging work.
- Charge lead-acid batteries only. Do not use battery charger to supply power to an extra-low-voltage electrical system or to charge dry cell batteries.
- Do not charge a frozen battery.
- Do not use damaged charging cables.
- Do not charge a battery that has loose terminals or one showing damage such as a cracked case or cover.
- Before charging battery, select correct charger voltage to match battery voltage.
- Set battery charging controls to the Off position before connecting to battery. Do not allow battery charging clips to touch each other.
- Keep charging cables away from vehicle hood, door, or moving parts.

FUEL can cause fire or explosion.

- Stop engine and let it cool off before checking or adding fuel.
- Do not add fuel while smoking or if unit is near any sparks or open flames.
- Do not overfill tank — allow room for fuel to expand.
- Do not spill fuel. If fuel is spilled, clean up before starting engine.
- Dispose of rags in a fireproof container.
- Always keep nozzle in contact with tank when fueling.

MOVING PARTS can injure.

- Keep away from moving parts such as fans, belts, and rotors.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Stop engine before installing or connecting unit.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance and troubleshooting as necessary.
- To prevent accidental starting during servicing, disconnect negative (–) battery cable from battery.
- Keep hands, hair, loose clothing, and tools away from moving parts.
- Reinstall doors, panels, covers, or guards when servicing is finished and before starting engine.
- Before working on generator, remove spark plugs or injectors to keep engine from kicking back or starting.
- Block flywheel so that it will not turn while working on generator components.

EXHAUST SPARKS can cause fire.

- Do not let engine exhaust sparks cause fire.
- Use approved engine exhaust spark arrestor in required areas — see applicable codes.

HOT PARTS can burn.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.

STEAM AND HOT COOLANT can burn.

- If possible, check coolant level when engine is cold to avoid scalding.
- Always check coolant level at overflow tank, if present on unit, instead of radiator (unless told otherwise in maintenance section or engine manual).
- If the engine is warm, checking is needed, and there is no overflow tank, follow the next two statements.
- Wear safety glasses and gloves and put a rag over radiator cap.
- Turn cap slightly and let pressure escape slowly before completely removing cap.

Using a generator indoors CAN KILL YOU IN MINUTES.

- Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell.
- NEVER use inside a home or garage, EVEN IF doors and windows are open.
- Only use OUTSIDE and far away from windows, doors, and vents.

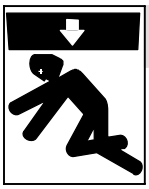
BATTERY ACID can BURN SKIN and EYES.

- Do not tip battery.
- Replace damaged battery.
- Flush eyes and skin immediately with water.

ENGINE HEAT can cause fire.

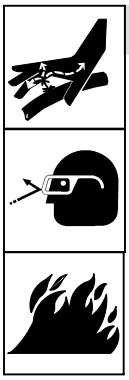
- Do not locate unit on, over, or near combustible surfaces or flammables.
- Keep exhaust and exhaust pipes way from flammables.

1-4. Hydraulic Hazards



HYDRAULIC EQUIPMENT can injure or kill.

- Incorrect installation or operation of this unit could result in equipment failure and personal injury. Only qualified persons should install, operate, and service this unit according to its Owner's Manual, industry standards, and national, state, and local codes.
- Do not exceed the rated output or capacity of the hydraulic pump or any equipment in the hydraulic system. Design hydraulic system so failure of any hydraulic component will not put people or property at risk.
- Before working on hydraulic system, turn off and lockout/tagout unit, release pressure, and be sure hydraulic pressure cannot be accidentally applied.
- Do not work on hydraulic system with unit running unless you are a qualified person and following the manufacturer's instructions.
- Do not modify or alter hydraulic pump or manufacturer-supplied equipment. Do not disconnect, disable, or override any safety equipment in the hydraulic system.
- Use only components/accessories approved by the manufacturer.
- Keep away from potential pinch points or crush points created by equipment connected to the hydraulic system.
- Do not work under or around any equipment that is supported only by hydraulic pressure. Properly support equipment by mechanical means.



HYDRAULIC FLUID can injure or kill.

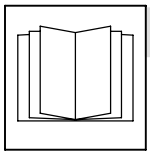
- Before working on hydraulic system, turn off and lockout/tagout unit, release pressure, and be sure hydraulic pressure cannot be accidentally applied.
- Relieve pressure before disconnecting or connecting hydraulic lines.
- Check hydraulic system components and all connections and hoses for damage, leaks, and wear before operating unit.
- Wear protective equipment such as safety glasses, leather gloves, heavy shirt and trousers, high shoes, and a cap when working on hydraulic system.
- Use a piece of paper or cardboard to search for leaks––never use bare hands. Do not use equipment if leaks are found.
- HYDRAULIC FLUID is FLAMMABLE––do not work on hydraulics near sparks or flames; do not smoke near hydraulic fluid.
- Reinstall doors, panels, covers, or guards when servicing is finished and before starting unit.
- If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene may result.

MOVING PARTS can injure.

- Keep away from moving parts such as fans, belts and rotors.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Keep hands, hair, loose clothing, and tools away from moving parts.
- Before working on hydraulic system, turn off and lockout/tagout unit, release pressure, and be sure hydraulic pressure cannot be accidentally applied.
- Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
- Reinstall doors, panels, covers, or guards when servicing is finished and before starting engine.

HOT PARTS AND FLUID can burn.

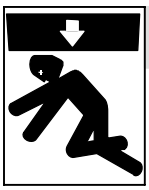
- Do not touch hot parts bare handed or allow hot fluid to contact skin.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform maintenance and service according to the Owner's Manuals, industry standards, and national, state, and local codes.

1-5. Compressed Air Hazards

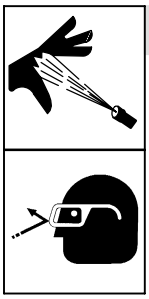


COMPRESSED AIR EQUIPMENT can injure or kill.

- Incorrect installation or operation of this unit could result in equipment failure and personal injury. Only qualified persons should install, operate, and service this unit according to its Owner's Manual, industry standards, and national, state, and local codes.
- Do not exceed the rated output or capacity of the compressor or any equipment in the compressed air system. Design compressed air system so failure of any component will not put people or property at risk.
- Before working on compressed air system, turn off and lockout/tagout unit, release pressure, and be sure air pressure cannot be accidentally applied.
- Do not work on compressed air system with unit running unless you are a qualified person and following the manufacturer's instructions.
- Do not modify or alter compressor or manufacturer-supplied equipment. Do not disconnect, disable, or override any safety equipment in the compressed air system.
- Use only components and accessories approved by the manufacturer.
- Keep away from potential pinch points or crush points created by equipment connected to the compressed air system.
- Do not work under or around any equipment that is supported only by air pressure. Properly support equipment by mechanical means.

HOT METAL from air arc cutting and gouging can cause fire or explosion.

- Do not cut or gouge near flammables.
- Watch for fire; keep extinguisher nearby.



COMPRESSED AIR can injure or kill.

- Before working on compressed air system, turn off and lockout/tagout unit, release pressure, and be sure air pressure cannot be accidentally applied.
- Relieve pressure before disconnecting or connecting air lines.
- Check compressed air system components and all connections and hoses for damage, leaks, and wear before operating unit.
- Do not direct air stream toward self or others.
- Wear protective equipment such as safety glasses, hearing protection, leather gloves, heavy shirt and trousers, high shoes, and a cap when working on compressed air system.
- Use soapy water or an ultrasonic detector to search for leaks–– never use bare hands. Do not use equipment if leaks are found.
- Reinstall doors, panels, covers, or guards when servicing is finished and before starting unit.
- If ANY air is injected into the skin or body seek medical help immediately.

BREATHING COMPRESSED AIR can injure or kill.

- Do not use compressed air for breathing.
- Use only for cutting, gouging, and tools.

TRAPPED AIR PRESSURE AND WHIPPING HOSES can injure.

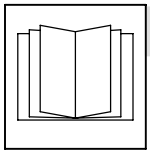
- Release air pressure from tools and system before servicing, adding or changing attachments, or opening compressor oil drain or oil fill cap.

MOVING PARTS can injure.

- Keep away from moving parts such as fans, belts and rotors.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Keep hands, hair, loose clothing, and tools away from moving parts.
- Before working on compressed air system, turn off and lockout/tagout unit, release pressure, and be sure air pressure cannot be accidentally applied.
- Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
- Reinstall doors, panels, covers, or guards when servicing is finished and before starting engine.

HOT PARTS can burn.

- Do not touch hot compressor or air system parts.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform maintenance and service according to the Owner's Manuals, industry standards, and national, state, and local codes.

1-6. Additional Symbols For Installation, Operation, And Maintenance

FIRE OR EXPLOSION hazard.

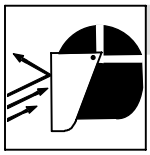
- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

FALLING EQUIPMENT can injure.

- Use lifting eye to lift unit and properly installed accessories only, NOT gas cylinders. Do not exceed maximum lift eye weight rating (see Specifications).
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.
- Keep equipment (cables and cords) away from moving vehicles when working from an aerial location.
- Follow the guidelines in the Applications Manual for the Revised NIOSH Lifting Equation (Publication No. 94–110) when manually lifting heavy parts or equipment.

OVERHEATING can damage motors.

- Turn off or unplug equipment before starting or stopping engine.
- Do not let low voltage and frequency caused by low engine speed damage electric motors.
- Do not connect 50 or 60 Hertz motors to the 100 Hertz receptacle where applicable.



FLYING SPARKS can injure.

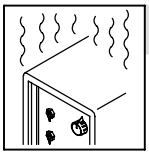
- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.

MOVING PARTS can injure.

- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

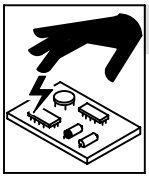
WELDING WIRE can injure.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.



OVERUSE can cause OVERHEATING.

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.

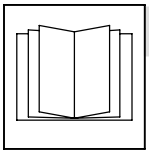


STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

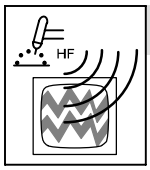
TILTING OF TRAILER can injure.

- Use tongue jack or blocks to support weight.
- Properly install welding generator onto trailer according to instructions supplied with trailer.



READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform maintenance and service according to the Owner's Manuals, industry standards, and national, state, and local codes.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as microprocessors, computers, and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-7. California Proposition 65 Warnings

Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. *Wash hands after handling.*

This product contains chemicals, including lead, known to the state of California to cause cancer, birth defects, or other reproductive harm. *Wash hands after use.*

For Gasoline Engines:

Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

For Diesel Engines:

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

1-8. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org and www. sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151 (phone: 703-788-2700, website:www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (phone: 800-463-6727, website: www.csa-international.org).

Battery Chargers, CSA Standard C22.2 NO 107.2–01, from Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (phone: 800-463-6727, website: www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org.

For Standards about hydraulic systems, contact the National Fluid Power Association, Publications Department, 3333 North Mayfair Road, Suite 211, Milwaukee, WI 53222-3219 (phone: (414) 778-3344, website: www.nfpa.com).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (phone: 1-866-512-1800) (there are 10 OSHA Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: www.osha.gov).

U.S. Consumer Product Safety Commission (CPSC), 4330 East West Highway, Bethesda, MD 20814 (phone: 301-504-7923, website: www.cpsc.gov).

Applications Manual for the Revised NIOSH Lifting Equation, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (phone: 1-800-232-4636, website: www.cdc.gov/NIOSH).

1-9. EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). Welding current creates an EMF field around the welding circuit and welding equipment. EMF fields may interfere with some medical implants, e.g. pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, access restrictions for passers–by or individual risk assessment for welders. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Do not place your body between welding cables. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to workpiece as close to the weld as possible.
6. Do not work next to, sit or lean on the welding power source.
7. Do not weld whilst carrying the welding power source or wire feeder.

About Implanted Medical Devices:

Implanted Medical Device wearers should consult their doctor and the device manufacturer before performing or going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations. If cleared by your doctor, then following the above procedures is recommended.

SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

Pour écarter les risques de blessure pour vous–même et pour autrui — lire, appliquer et ranger en lieu sûr ces consignes relatives aux précautions de sécurité et au mode opératoire.

2-1. Signification des symboles

DANGER! – Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

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***NOTE** – Indique des déclarations pas en relation avec des blessures personnelles.*

☞ *Indique des instructions spécifiques.*

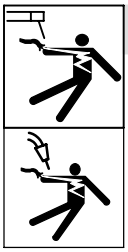
Ce groupe de symboles veut dire Avertissement! Attention! DANGER DE CHOC ELECTRIQUE, PIECES EN MOUVEMENT, et PIECES CHAUDES. Consulter les symboles et les instructions ci-dessous y afférant pour les actions nécessaires afin d'éviter le danger.

2-2. Dangers relatifs au soudage à l'arc

Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 2-8. Veuillez lire et respecter toutes ces normes de sécurité.

L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.

Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.



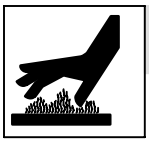
UN CHOC ÉLECTRIQUE peut tuer.

Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

- Ne jamais toucher les pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs ne comportant pas de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
- Ne pas se servir de source électrique à courant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique à courant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique à courant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Des précautions de sécurité supplémentaires sont requises dans des environnements à risque comme: les endroits humides ou lorsque l'on porte des vêtements mouillés; sur des structures métalliques au sol, grillages et échafaudages; dans des positions assises, à genoux et allongées; ou quand il y a un risque important de contact accidentel avec la pièce ou le sol. Dans ces cas utiliser les appareils suivants dans l'ordre de préférence: 1) un poste à souder DC semi–automatique de type CV (MIG/MAG), 2) un poste à souder manuel (électrode enrobée) DC, 3) un poste à souder manuel AC avec tension à vide réduite. Dans la plupart des cas, un poste courant continu de type CV est recommandé. Et, ne pas travailler seul!
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation – Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Les câbles doivent être exempts d'humidité, d'huile et de graisse; protégez–les contre les étincelles et les pièces métalliques chaudes.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé – remplacer le cordon immédiatement s'il est endommagé – un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct – ne pas utiliser le connecteur de pièce ou le câble de retour.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- Ne pas toucher des porte électrodes connectés à deux machines en même temps à cause de la présence d'une tension à vide doublée.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.

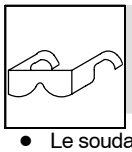
Il reste une TENSION DC NON NÉGLIGEABLE dans les sources de soudage onduleur UNE FOIS le moteur coupé.

- Couper l'alimentation du poste et décharger les condensateurs d'entrée comme indiqué dans la Section Maintenance avant de toucher des composants.



LES PIÈCES CHAUDES peuvent provoquer des brûlures.

- Ne pas toucher à mains nues les parties chaudes.
- Prévoir une période de refroidissement avant de travailler à l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.



DES PIECES DE METAL ou DES SALETES peuvent provoquer des blessures dans les yeux.

- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'intérieur, ventiler la zone et/ou utiliser une ventilation forcée au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est médiocre, porter un respirateur anti-vapeurs approuvé.
- Lire et comprendre les spécifications de sécurité des matériaux (MSDS) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

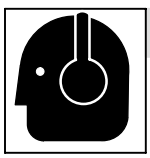
Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage approuvé muni de verres filtrants approprié pour protéger visage et yeux pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des lunettes de sécurité avec écrans latéraux même sous votre casque.
- Avoir recours à des écrans protecteurs ou à des rideaux pour protéger les autres contre les rayonnements les éblouissements et les étincelles ; prévenir toute personne sur les lieux de ne pas regarder l'arc.
- Porter des vêtements confectionnés avec des matières résistantes et ignifuges (cuir, coton lourd ou laine) et des bottes de protection.

LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Ne soudez pas si l'air ambiant est chargé de particules, gaz, ou vapeurs inflammables (vapeur d'essence, par exemple).
- Brancher le câble de masse sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution, d'étincelles et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.
- Une fois le travail achevé, assurez–vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe–circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Suivre les recommandations dans OSHA 1910.252(a)(2)(iv) et NFPA 51B pour les travaux à chaud et avoir de la surveillance et un extincteur à proximité.



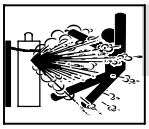
LE BRUIT peut affecter l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvés pour les oreilles si le niveau sonore est trop élevé.

Les CHAMPS ÉLECTROMAGNÉTIQUES (CEM) peuvent affecter les implants médicaux.

- Les porteurs de stimulateurs cardiaques et autres implants médicaux doivent rester à distance.
- Les porteurs d'implants médicaux doivent consulter leur médecin et le fabricant du dispositif avant de s'approcher de la zone où se déroule du soudage à l'arc, du soudage par points, du gougeage, de la découpe plasma ou une opération de chauffage par induction.



Si des BOUTEILLES sont endommagées, elles pourront exploser.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, des dommages physiques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Utiliser les équipements corrects, les bonnes procédures et suffisamment de personnes pour soulever et déplacer les bouteilles.
- Lire et suivre les instructions sur les bouteilles de gaz comprimé, l'équipement connexe et le dépliant P-1 de la CGA (Compressed Gas Association) mentionné dans les principales normes de sécurité.

2-3. Dangers existant en relation avec le moteur

L'EXPLOSION DE LA BATTERIE peut provoquer des blessures.

- Toujours porter une protection faciale, des gants en caoutchouc et vêtements de protection lors d'une intervention sur la batterie.
- Arrêter le moteur avant de débrancher ou de brancher des câbles de batterie, des câbles de chargeur de batterie (le cas échéant) ou de batterie d'entretien.
- Eviter de provoquer des étincelles avec les outils en travaillant sur la batterie.
- Ne pas utiliser l'appareil de soudage pour charger des batteries ou faire démarrer des véhicules à l'aide de câbles de démarrage, sauf si l'appareil dispose d'une fonctionnalité de charge de batterie destinée à cet usage.
- Observer la polarité correcte (+ et –) sur les batteries.
- Débrancher le câble négatif (–) en premier lieu. Le rebrancher en dernier lieu.
- Les sources d'étincelles, flammes nues, cigarettes et autres sources d'inflammation doivent être maintenues à l'écart des batteries. Ces dernières produisent des gaz explosifs en fonctionnement normal et en cours de charge.
- Respecter les consignes du fabricant de la batterie pour travailler sur une batterie ou à proximité.

Le COURANT DE CHARGE DE BATTERIE peut provoquer des blessures (la fonctionnalité de charge de batterie n'est pas disponible sur tous les modèles).

- Les opérations de charge de batterie ne doivent être effectuées que par des personnes qualifiées.
- Ne charger que des batteries plomb–acide. Ne pas utiliser le chargeur de batterie pour alimenter un autre circuit électrique basse tension ou pour charger des batteries sèches.
- Ne pas charger une batterie gelée.
- Ne pas utiliser de câbles de charge endommagés.
- Ne pas charger une batterie dont les bornes sont desserrées ou présentant une détérioration comme par exemple un boîtier ou un couvercle fissuré.
- Avant de charger une batterie, sélectionner la tension de charge correspondant à la tension de la batterie.
- Régler les commandes de charge de batterie sur la position d'arrêt avant de brancher la batterie. Veiller à ce que les pinces de charge ne se touchent pas.
- Ranger les câbles de charge à distance du capot, des portes et des pièces mobiles du véhicule.

LE CARBURANT MOTEUR peut provoquer un incendie ou une explosion.

- Arrêter le moteur avant de vérifier le niveau de carburant ou de faire le plein.
- Ne pas faire le plein en fumant ou proche d'une source d'étincelles ou d'une flamme nue.
- Ne pas faire le plein de carburant à ras bord; prévoir de l'espace pour son expansion.
- Faire attention de ne pas renverser de carburant. Nettoyer tout carburant renversé avant de faire démarrer le moteur.
- Jeter les chiffons dans un récipient ignifuge.
- Toujours garder le pistolet en contact avec le réservoir lors du remplissage.

Les PIÈCES MOBILES peuvent causer des blessures.

- S'abstenir de toucher des parties mobiles telles que des ventilateurs, courroies et rotors.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Arrêter le moteur avant d'installer ou brancher l'appareil.
- Lorsque cela est nécessaire pour des travaux d'entretien et de dépannage, faire retirer les portes, panneaux, recouvrements ou dispositifs de protection uniquement par du personnel qualifié.
- Pour empêcher tout démarrage accidentel pendant les travaux d'entretien, débrancher le câble négatif (–) de batterie de la borne.
- Ne pas approcher les mains, cheveux, vêtements lâches et outils des organes mobiles.
- Remettre en place les portes, panneaux, recouvrements ou dispositifs de protection à la fin des travaux d'entretien et avant de mettre le moteur en marche.
- Avant d'intervenir, déposer les bougies ou injecteurs pour éviter la mise en route accidentelle du moteur.
- Bloquer le volant moteur pour éviter sa rotation lors d'une intervention sur le générateur.

LES ÉTINCELLES À L'ÉCHAPPEMENT peuvent provoquer un incendie.

- Empêcher les étincelles d'échappement du moteur de provoquer un incendie.
- Utiliser uniquement un pare-étincelles approuvé – voir codes en vigueur.

LES PIÈCES CHAUDES peuvent provoquer des brûlures.

- Ne pas toucher des parties chaudes à mains nues.
- Prévoir une période de refroidissement avant de travailler à l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.

LA VAPEUR ET LE LIQUIDE DE REFROIDISSEMENT CHAUD peuvent provoquer des brûlures.

- Il est préférable de vérifier le liquide de refroidissement une fois le moteur refroidi pour éviter de se brûler.
- Toujours vérifier le niveau de liquide de refroidissement dans le vase d'expansion (si présent), et non dans le radiateur (sauf si précisé autrement dans la section maintenance du manuel du moteur).
- Si le moteur est chaud et que le liquide doit être vérifié, opérer comme suivant.
- Mettre des lunettes de sécurité et des gants, placer un torchon sur le bouchon du radiateur.
- Dévisser le bouchon légèrement et laisser la vapeur s'échapper avant d'enlever le bouchon.

L'utilisation d'un groupe autonome à l'intérieur PEUT VOUS TUER EN QUELQUES MINUTES.

- Les fumées d'un groupe autonome contient du monoxyde de carbone. C'est un poison invisible et inodore.
- JAMAIS utiliser dans une maison ou garage, même avec les portes et fenêtres ouvertes.
- Uniquement utiliser à l'EXTERIEUR, loin des portes, fenêtres et bouches aération.

L'ACIDE DE LA BATTERIE peut provoquer des brûlures dans les YEUX et sur la PEAU.

- Ne pas renverser la batterie.
- Remplacer une batterie endommagée.
- Rincer immédiatement les yeux et la peau à l'eau.

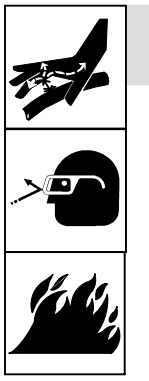
LA CHALEUR DU MOTEUR peut provoquer un incendie.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Tenir à distance les produits inflammables de l'échappement.

2-4. Dangers liés à l'hydraulique

Les ÉQUIPEMENTS HYDRAULIQUES peuvent provoquer des blessures ou même la mort.

- Une installation ou une utilisation incorrecte de cet appareil pourrait conduire à des dégâts matériels ou corporels. Seul un personnel qualifié est autorisé à installer, faire fonctionner et réparer cet appareil conformément à son manuel d'utilisation, aux normes industrielles et aux codes nationaux, d'état ou locaux.
- Ne pas dépasser le débit nominal ou la capacité de la pompe hydraulique ou de tout équipement du circuit hydraulique. Concevoir le circuit hydraulique de telle sorte que la défaillance d'un composant hydraulique ne risque pas de provoquer un accident matériel ou corporel.
- Avant d'intervenir sur le circuit hydraulique, couper l'alimentation électrique, verrouiller et étiqueter l'appareil, détendre la pression et s'assurer que le circuit hydraulique ne peut être remis sous pression par inadvertance.
- Ne pas intervenir sur le circuit hydraulique lorsque l'appareil fonctionne. Seul un personnel qualifié et appliquant les consignes du fabricant est autorisé le faire.
- Ne pas modifier ou altérer la pompe hydraulique ou les équipements fournis par le fabricant. Ne pas débrancher, désactiver ou neutraliser les équipements de sécurité du circuit hydraulique.
- Utiliser uniquement des composants et accessoires homologués par le fabricant.
- Se tenir à l'écart de tout point présentant un danger de pincement ou d'écrasement créé par l'équipement raccordé au circuit hydraulique.
- Ne pas intervenir sous ou autour d'un équipement qui n'est soutenu que par la pression hydraulique. Soutenir l'équipement de façon appropriée par un moyen mécanique.



Le LIQUIDE HYDRAULIQUE risque de provoquer des blessures ou même la mort.

- Avant d'intervenir sur le circuit hydraulique, couper l'alimentation électrique, verrouiller et étiqueter l'appareil, détendre la pression et s'assurer que le circuit hydraulique ne peut être remis sous pression par inadvertance.
- Détendre la pression avant de débrancher ou de brancher des canalisations hydrauliques.
- Avant d'utiliser l'appareil, contrôler les composants du circuit hydraulique, les branchements et les flexibles en recherchant tout signe de détérioration, de fuite et d'usure.
- Pour intervenir sur un circuit hydraulique, porter un équipement de protection tel que des lunettes de sécurité, des gants de cuir, une chemise et un pantalon en tissu résistant, des chaussures montantes et une coiffe.
- Pour rechercher des fuites, utiliser un morceau de papier ou de carton, jamais les mains nues. En cas de détection de fuite, ne pas utiliser l'équipement.
- Le LIQUIDE HYDRAULIQUE est INFLAMMABLE. Ne pas intervenir sur des composants hydrauliques à proximité d'étincelles ou de flammes; ne pas fumer à proximité de liquide hydraulique.
- Remettre les portes, panneaux, recouvrements ou dispositifs de protection quand l'entretien est terminé et avant de mettre en marche l'appareil.
- En cas de pénétration d'un QUELCONQUE liquide dans la peau, celui–ci doit être retiré chirurgicalement sous quelques heures par

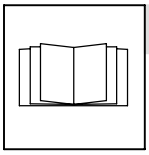
un médecin familiarisé avec ce type de blessure, faute de quoi la gangrène pourrait apparaître.

Les PIÈCES MOBILES peuvent causer des blessures.

- S'abstenir de toucher des parties mobiles telles que des ventilateurs, courroies et rotors.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Ne pas approcher les mains, cheveux, vêtements lâches et outils des organes mobiles.
- Avant d'intervenir sur le circuit hydraulique, couper l'alimentation électrique, verrouiller et étiqueter l'appareil, détendre la pression et s'assurer que le circuit hydraulique ne peut être remis sous pression par inadvertance.
- Demander seulement à un personnel qualifié d'enlever les dispositifs de sécurité ou les recouvrements pour effectuer, s'il y a lieu, des travaux d'entretien et de dépannage.
- Remettre en place les portes, panneaux, recouvrements ou dispositifs de protection à la fin des travaux d'entretien et avant de mettre le moteur en marche.

LES PIÈCES ET LIQUIDES CHAUDS peuvent provoquer des brûlures.

- Ne pas toucher les pièces chaudes à main nue ni laisser des liquides chauds entrer en contact avec la peau.
- Prévoir une période de refroidissement avant d'intervenir sur l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.



LIRE LES INSTRUCTIONS.

- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que les pièces de rechange recommandées par le constructeur.
- Effectuer l'entretien en respectant les manuels d'utilisation, les normes industrielles et les codes nationaux, d'état et locaux.

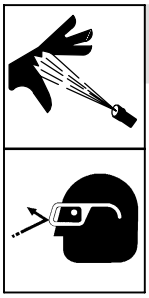
2-5. Dangers liés à l'air comprimé

Un ÉQUIPEMENT PNEUMATIQUE risque de provoquer des blessures ou même la mort.

- Une installation ou une utilisation incorrecte de cet appareil pourrait conduire à des dégâts matériels ou corporels. Seul un personnel qualifié est autorisé à installer, utiliser et entretenir cet appareil conformément à son manuel d'utilisation, aux normes industrielles et aux codes nationaux, d'état ou locaux.
- Ne pas dépasser le débit nominal ou la capacité du compresseur ou de tout équipement du circuit d'air comprimé. Concevoir le circuit d'air comprimé de telle sorte que la défaillance d'un composant ne risque pas de provoquer un accident matériel ou corporel.
- Avant d'intervenir sur le circuit d'air comprimé, couper l'alimentation électrique, verrouiller et étiqueter l'appareil, détendre la pression et s'assurer que le circuit d'air ne peut être mis sous pression par inadvertance.
- Ne pas intervenir sur le circuit d'air comprimé lorsque l'appareil fonctionne. Seul un personnel qualifié est autorisé, et appliquant les consignes du fabricant.
- Ne pas modifier ou altérer le compresseur ou les équipements fournis par le fabricant. Ne pas débrancher, désactiver ou neutraliser les équipements de sécurité du circuit d'air comprimé.
- Utiliser uniquement des composants et accessoires homologués par le fabricant.
- Se tenir à l'écart de tout point présentant un danger de pincement ou d'écrasement créé par l'équipement raccordé au circuit d'air comprimé.
- Ne pas intervenir sous ou autour d'un équipement qui n'est soutenu que par la pression pneumatique. Soutenir l'équipement de façon appropriée par un moyen mécanique.

MÉTAL CHAUD provenant du découpage ou du gougeage à l'arc risque de provoquer un incendie ou une explosion.

- Ne pas découper ou gouger à proximité de produits inflammables.
- Attention aux risques d'incendie: tenir un extincteur à proximité.



L'AIR COMPRIMÉ risque de provoquer des blessures ou même la mort.

- Avant d'intervenir sur le circuit d'air comprimé, couper l'alimentation électrique, verrouiller et étiqueter l'appareil, détendre la pression et s'assurer que le circuit d'air ne peut être mis sous pression par inadvertance.
- Détendre la pression avant de débrancher ou de brancher des canalisations d'air.
- Avant d'utiliser l'appareil, contrôler les composants du circuit d'air comprimé, les branchements et les flexibles en recherchant tout signe de détérioration, de fuite et d'usure.
- Ne pas diriger un jet d'air vers soi–même ou vers autrui.
- Pour intervenir sur un circuit d'air comprimé, porter un équipement de protection tel que des lunettes de sécurité, des gants de cuir, une chemise et un pantalon en tissu résistant, des chaussures montantes et une coiffe.
- Pour rechercher des fuites, utiliser de l'eau savonneuse ou un détecteur à ultrasons, jamais les mains nues. En cas de détection de fuite, ne pas utiliser l'équipement.
- Remettre les portes, panneaux, recouvrements ou dispositifs de protection quand l'entretien est terminé et avant de mettre en marche l'appareil.
- En cas d'injection d'air dans la peau ou le corps, demander immédiatement une assistance médicale.

L'INHALATION D'AIR COMPRIMÉ risque de provoquer des blessures ou même la mort.

- Ne pas inhaler d'air comprimé.
- Utiliser l'air comprimé uniquement pour découper ou gouger ainsi que pour l'outillage pneumatique.

Une PRESSION D'AIR RÉSIDUELLE ET DES FLEXIBLES QUI FOUETTENT risquent de provoquer des blessures.

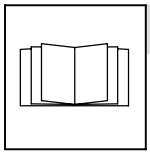
- Détendre la pression pneumatique des outils et circuits avant d'entretenir, ajouter ou changer des accessoires et avant d'ouvrir le bouchon de vidange ou de remplissage d'huile du compresseur.

Les PIÈCES MOBILES peuvent causer des blessures.

- S'abstenir de toucher des parties mobiles telles que des ventilateurs, courroies et rotors.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Ne pas approcher les mains, cheveux, vêtements lâches et outils des organes mobiles.
- Avant d'intervenir sur le circuit d'air comprimé, couper l'alimentation électrique, verrouiller et étiqueter l'appareil, détendre la pression et s'assurer que le circuit d'air ne peut être mis sous pression par inadvertance.
- Demander seulement à un personnel qualifié d'enlever les dispositifs de sécurité ou les recouvrements pour effectuer, s'il y a lieu, des travaux d'entretien et de dépannage.
- Remettre en place les portes, panneaux, recouvrements ou dispositifs de protection à la fin des travaux d'entretien et avant de mettre le moteur en marche.

DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Ne pas toucher de pièces chaudes du compresseur ou du circuit d'air.
- Prévoir une période de refroidissement avant d'intervenir sur l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.



LIRE LES INSTRUCTIONS.

- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que les pièces de rechange recommandées par le constructeur.
- Effectuer l'entretien en respectant les manuels d'utilisation, les normes industrielles et les codes nationaux, d'état et locaux.

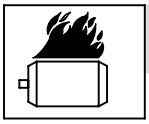
2-6. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Ne pas installer l'appareil à proximité de produits inflammables.
- Ne pas surcharger l'installation électrique – s'assurer que l'alimentation est correctement dimensionnée et protégée avant de mettre l'appareil en service.

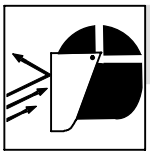
LA CHUTE DE L'ÉQUIPEMENT peut provoquer des blessures.

- Utiliser l'anneau de levage pour lever l'appareil et les accessoires correctement installées seuls, PAS les bouteilles de gaz. Ne pas dépasser le poids nominal maximal de l'œilleton (voir les spécifications).
- Utiliser un équipement de levage de capacité suffisante pour lever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.
- Tenir l'équipement (câbles et cordons) à distance des véhicules mobiles lors de toute opération en hauteur.
- Suivre les consignes du Manuel des applications pour l'équation de levage NIOSH révisée (Publication Nº94–110) lors du levage manuelle de pièces ou équipements lourds.



LE SURCHAUFFEMENT peut endommager le moteur électrique.

- Arrêter ou déconnecter l'équipement avant de démarrer ou d'arrêter le moteur.
- Ne pas laisser tourner le moteur trop lentement sous risque d'endommager le moteur électrique à cause d'une tension et d'une fréquence trop faibles.
- Ne pas brancher de moteur de 50 ou de 60 Hz à la prise de 100 Hz, s'il y a lieu.



LES ÉTINCELLES PROJETÉES peuvent provoquer des blessures.

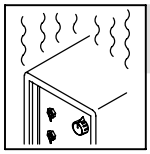
- Porter un écran facial pour protéger le visage et les yeux.
- Affûter l'électrode au tungstène uniquement à la meuleuse dotée de protecteurs. Cette manœuvre est à exécuter dans un endroit sûr lorsque l'on porte l'équipement homologué de protection du visage, des mains et du corps.
- Les étincelles risquent de causer un incendie – éloigner toute substance inflammable.

Les PIÈCES MOBILES peuvent causer des blessures.

- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.

LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gâchette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.



L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

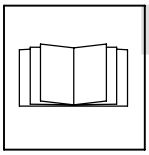
- Laisser l'équipement refroidir ; respecter le facteur de marche nominal.
- Réduire le courant ou le facteur de marche avant de poursuivre le soudage.
- Ne pas obstruer les passages d'air du poste.

LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

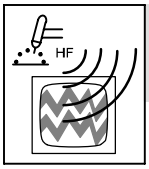
UNE REMORQUE QUI BASCULE peut provoquer des blessures.

- Utiliser les supports de la remorque ou des blocs pour soutenir le poids.
- Installer convenablement le poste sur la remorque comme indiqué dans le manuel s'y rapportant.



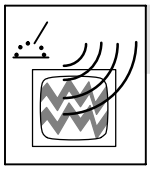
LIRE LES INSTRUCTIONS.

- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que les pièces de rechange recommandées par le constructeur.
- Effectuer l'entretien en respectant les manuels d'utilisation, les normes industrielles et les codes nationaux, d'état et locaux.



LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute fréquence (H.F.) peut provoquer des interférences avec les équipements de radio–navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et un blindage pour réduire les interférences éventuelles.



LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

2-7. Proposition californienne 65 Avertissements

⚠ **Les équipements de soudage et de coupage produisent des fumées et des gaz qui contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des malformations congénitales et, dans certains cas, des cancers. (Code de santé et de sécurité de Californie, chapitre 25249.5 et suivants)**

⚠ **Les batteries, les bornes et autres accessoires contiennent du plomb et des composés à base de plomb, produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation. Se laver les mains après manipulation.**

⚠ **Ce produit contient des produits chimiques, compris du plomb, dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation. Se laver les mains après manipulation.**

Pour les moteurs à essence :

⚠ **Les gaz d'échappement des moteurs contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation.**

Pour les moteurs diesel :

⚠ **Les gaz d'échappement des moteurs diesel et certains de leurs composants sont reconnus par l'État de Californie comme provoquant des cancers et des malformations congénitales ou autres problèmes de procréation.**

2-8. Principales normes de sécurité

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org and www. sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151 (phone: 703-788-2700, website:www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (phone: 800-463-6727, website: www.csa-international.org).

Battery Chargers, CSA Standard C22.2 NO 107.2–01, from Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (phone: 800-463-6727, website: www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org.

For Standards about hydraulic systems, contact the National Fluid Power Association, Publications Department, 3333 North Mayfair Road, Suite 211, Milwaukee, WI 53222-3219 (phone: (414) 778-3344, website: www.nfpa.com).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (phone: 1-866-512-1800) (there are 10 OSHA Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: www.osha.gov).

U.S. Consumer Product Safety Commission (CPSC), 4330 East West Highway, Bethesda, MD 20814 (phone: 301-504-7923, website: www.cpsc.gov).

Applications Manual for the Revised NIOSH Lifting Equation, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (phone: 1-800-232-4636, website: www.cdc.gov/NIOSH).

2-9. Informations relatives aux CEM

Le courant électrique qui traverse tout conducteur génère des champs électromagnétiques (CEM) à certains endroits. Le courant de soudage crée un CEM autour du circuit et du matériel de soudage. Les CEM peuvent créer des interférences avec certains implants médicaux comme des stimulateurs cardiaques. Des mesures de protection pour les porteurs d'implants médicaux doivent être prises: par exemple, des restrictions d'accès pour les passants ou une évaluation individuelle des risques pour les soudeurs. Tous les soudeurs doivent appliquer les procédures suivantes pour minimiser l'exposition aux CEM provenant du circuit de soudage:

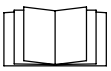
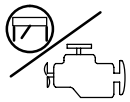
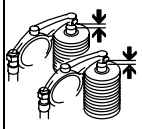
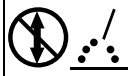
1. Rassembler les câbles en les torsadant ou en les attachant avec du ruban adhésif ou avec une housse.
2. Ne pas se tenir au milieu des câbles de soudage. Disposer les câbles d'un côté et à distance de l'opérateur.
3. Ne pas courber et ne pas entourer les câbles autour de votre corps.
4. Maintenir la tête et le torse aussi loin que possible du matériel du circuit de soudage.
5. Connecter la pince sur la pièce aussi près que possible de la soudure.
6. Ne pas travailler à proximité d'une source de soudage, ni s'asseoir ou se pencher dessus.
7. Ne pas souder tout en portant la source de soudage ou le dévidoir.

En ce qui concerne les implants médicaux :

Les porteurs d'implants doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de soudage par points, de gougeage, du coupage plasma ou de chauffage par induction. Si le médecin approuve, il est recommandé de suivre les procédures précédentes.

SECTION 3 – DEFINITIONS

3-1. Symbol Definitions

	Stop Engine		Fast (Run, Weld/Power)		Fast/Slow (Run/Idle)		Slow (Idle)
	Start Engine		Read Operator's Manual	**A**	Amperes	**V**	Volts
	Engine Oil		Fuel		Battery (Engine)		Engine
	Temperature		Check Valve Clearance		Do not switch while welding		Work Connection
	Positive		Negative		Alternating Current (AC)		Output
	Welding Arc (Electrode)		MIG (GMAW), Wire		Stick (SMAW)		TIG (GTAW)
h	Hours	**s**	Seconds		Time		Protective Earth (Ground)
	Circuit Protector						

SECTION 4 – SPECIFICATIONS

4-1. Weld, Power, and Engine Specifications

☞ *Also see Performance Data in Section 12.*

Welding Mode	Rated Welding Output	Maximum Open-Circuit Voltage	Weld Output Range	Generator Power Rating	Fuel Capacity	Engine
CC/DC	280 A, 25 V, 100% Duty Cycle	50	10 – 300 A	Continuous: 9.5 kVA/ kW, 80/40 A, 120/240 V AC, 60 Hz, Single-Phase, Peak: 11 kVA/kW (w/Weld Contactor Off)	12 gal (45 L) Tank	Kubota D722 Water-Cooled, Three-Cylinder, Four-Cycle, 18.8 HP Diesel Engine
CV/DC	300 A, 25 V, 100% Duty Cycle	35	13 – 35 V, 10–325 A			
CC/AC	200 A, 25 V, 60% Duty Cycle	50	30 – 225 A			

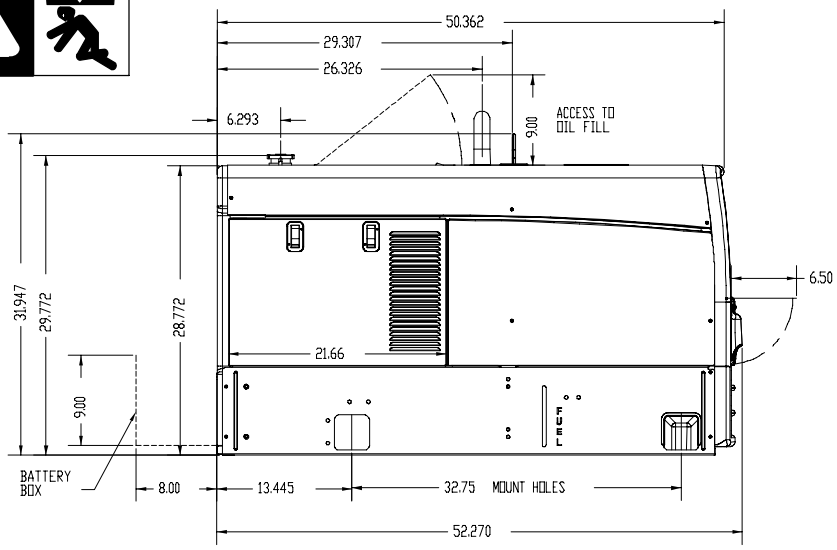
4-2. Dimensions, Weights, And Operating Angles

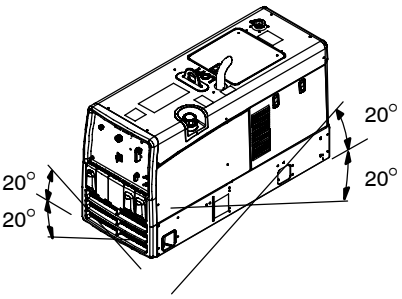
⚠ Do not exceed tilt angles or engine could be damaged or unit could tip.

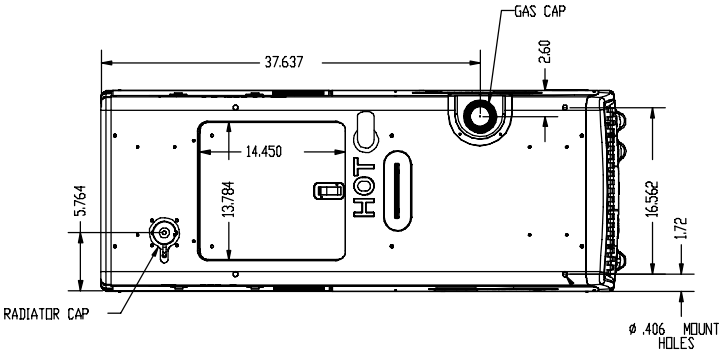
⚠ Do not move or operate unit where it could tip.

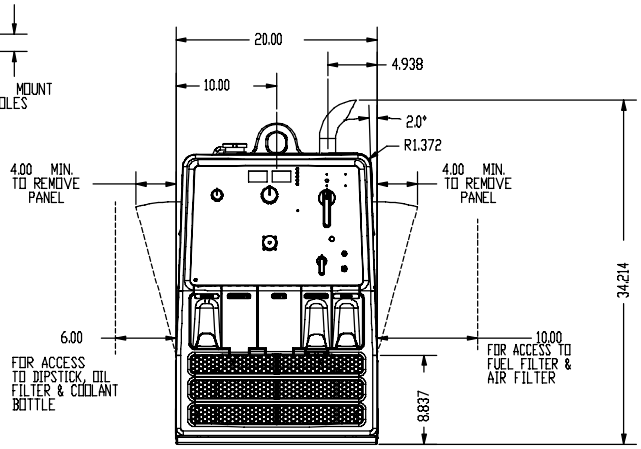
Weight: 720 lb (363 kg)

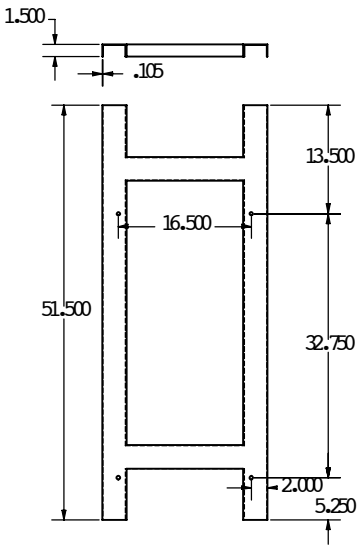
Lifting Eye Weight Rating: 1280 lb (580 kg)



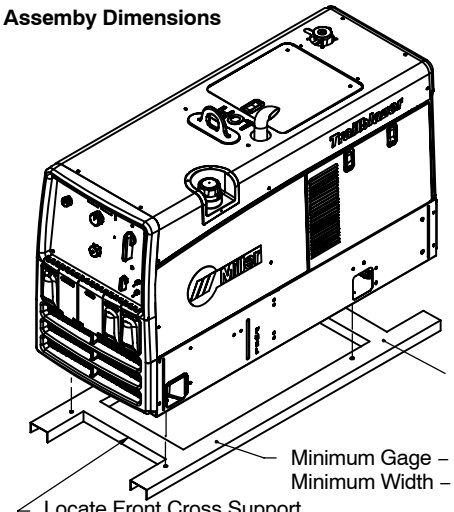








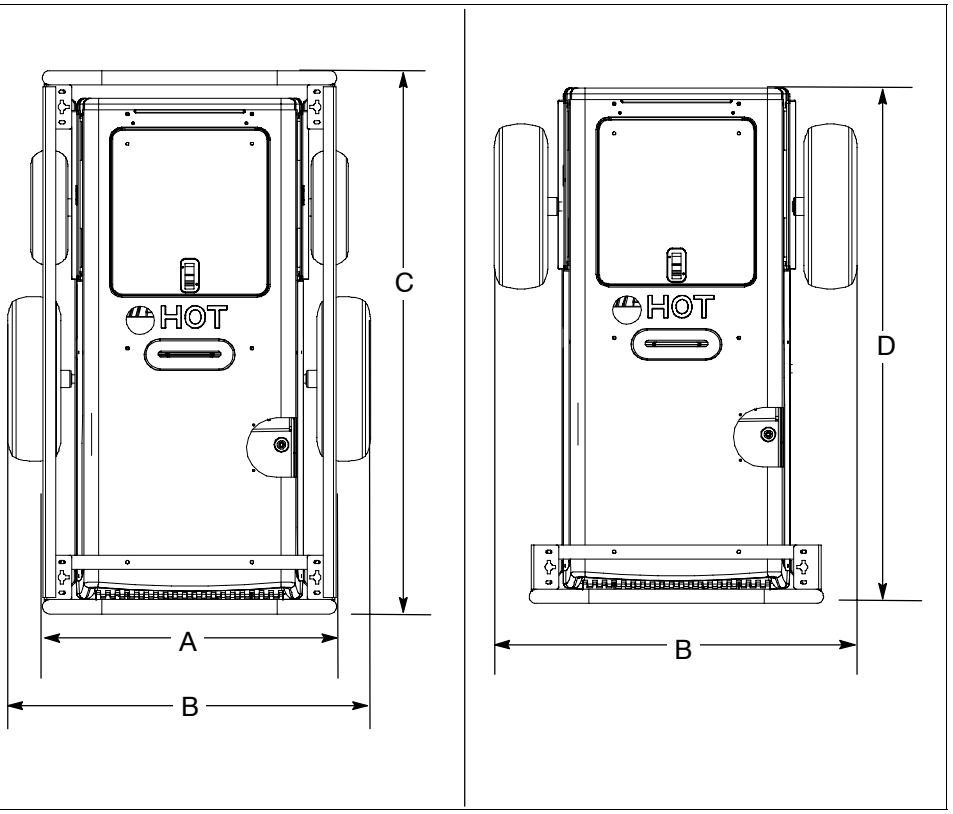
Support Assemby Dimensions


Locate Rear Cross Support Under Engine
Minimum Gage – 12
Minimum Width – 3 in.
Locate Front Cross Support Approximately 1 in. Behind Mounting Holes

803 572 / Ref 232 770

4-3. Dimensions For Units With Optional Running Gear

Dimensions	
Height	All Running Gear Options: 42-1/2 in. (1079 mm) (To Top Of Handle Assembly)
A	Protective Cage Width: 26 in. (660 mm)
B	Running Gear Width: 32 in. (813 mm)
C	Protective Cage Length: 48 in. (1219 mm)
D	Running Gear Length: 45–1/2 in. (1156 mm)



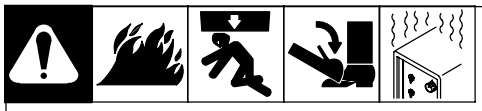
Notes

SECTION 5 – INSTALLATION

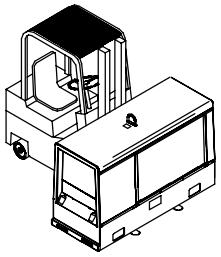
5-1. Serial Number And Rating Label Location

The serial number and rating information for this product is located on the back. Use rating label to determine input power requirements and/or rated output. For future reference, write serial number in space provided on back cover of this manual.

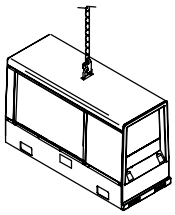
5-2. Installing Welding Generator



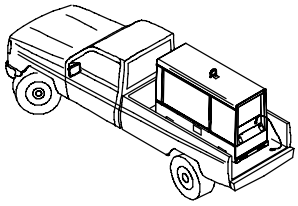
Movement



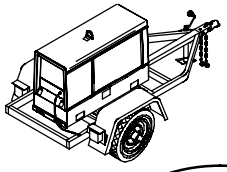
OR

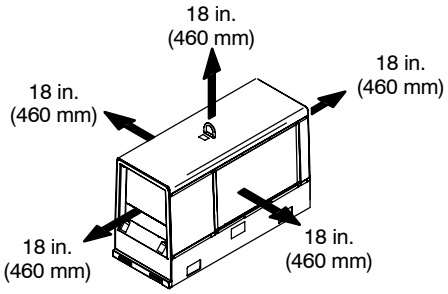


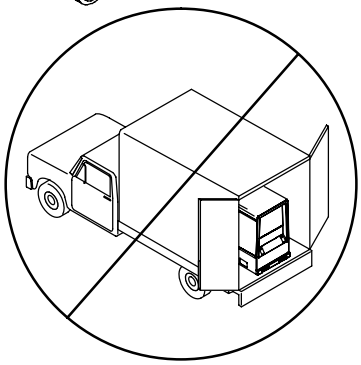
Location / Airflow Clearance



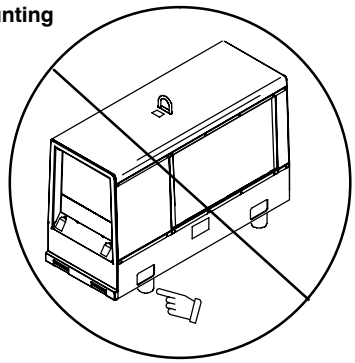
OR

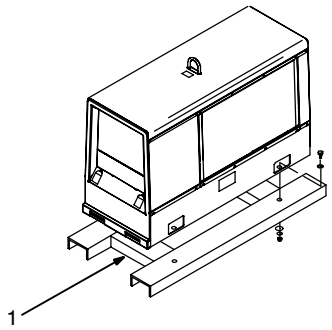






Mounting





Do not move or operate unit where it could tip.

Do not lift unit from end.

Do not weld on base. Welding on base can cause fuel tank fire or explosion. Bolt unit down using holes provided in base.

Always securely fasten welding generator onto transport vehicle or trailer and comply with all DOT and other applicable codes.

NOTICE *– Do not install unit where air flow is restricted or engine may overheat.*

☞ *See Section 4-2 for lifting eye rating.*

Mounting:

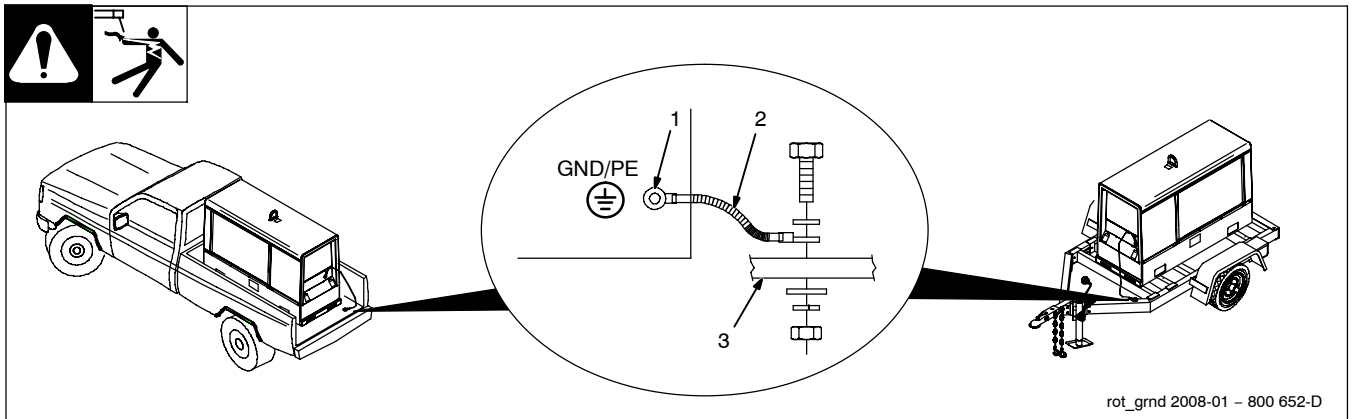
Do not mount unit by supporting the base only at the four mounting holes. Do not use flexible mounts. Use cross-supports to adequately support unit and prevent damage to base.

8 Cross-Supports

Mount unit on flat surface or use cross-supports to support base, see Section 4-2.

install2 2008-01 – Ref. 800 652 / Ref. 800 477-A / 803 274-A / 804 712

5-3. Grounding Generator To Truck Or Trailer Frame



rot_grnd 2008-01 – 800 652-D

⚠ **Always ground generator frame to vehicle frame to prevent electric shock and static electricity hazards.**

⚠ **Also see AWS Safety & Health Fact Sheet No. 29, Grounding of Portable And Vehicle Mounted Welding Generators.**

⚠ **Bed liners, shipping skids, and some running gear insulate the welding generator from the vehicle frame. Always connect a ground wire from the generator equipment grounding terminal to bare metal on the vehicle frame as shown.**

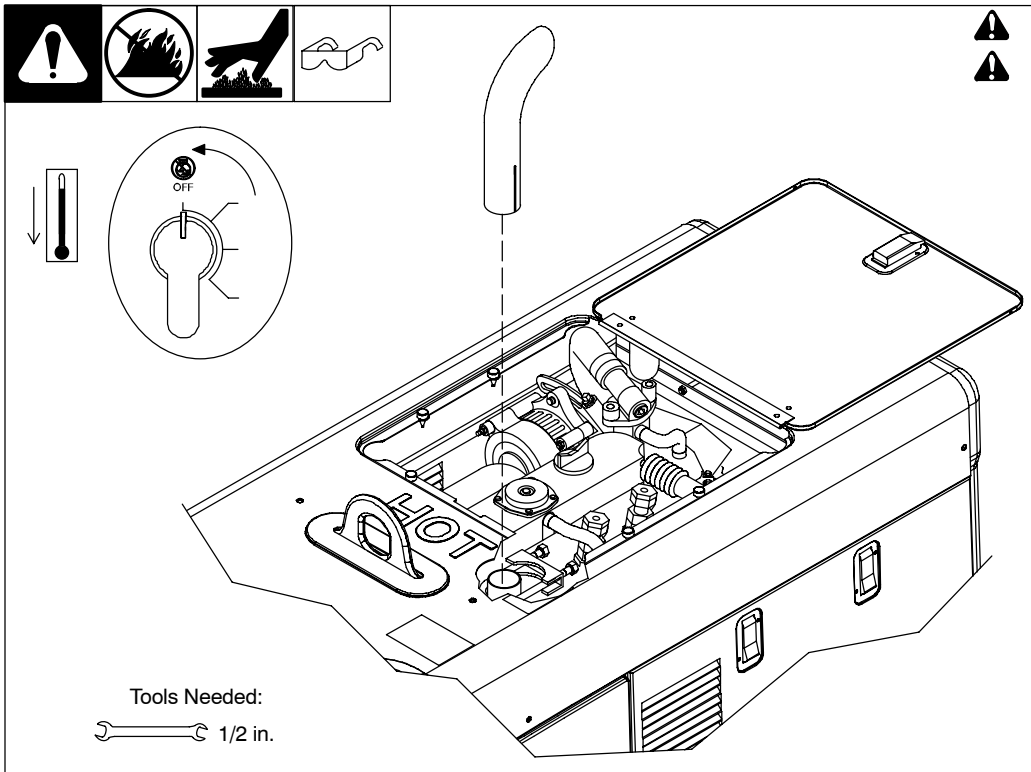
⚠ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

1 Equipment Grounding Terminal (On Front Panel)
2 Grounding Cable (Not Supplied)
3 Metal Vehicle Frame

Connect cable from equipment ground terminal to metal vehicle frame. Use #10 AWG or larger insulated copper wire.

☞ *Electrically bond generator frame to vehicle frame by metal-to-metal contact.*

5-4. Installing Exhaust Pipe



⚠ **Stop engine and let cool.**

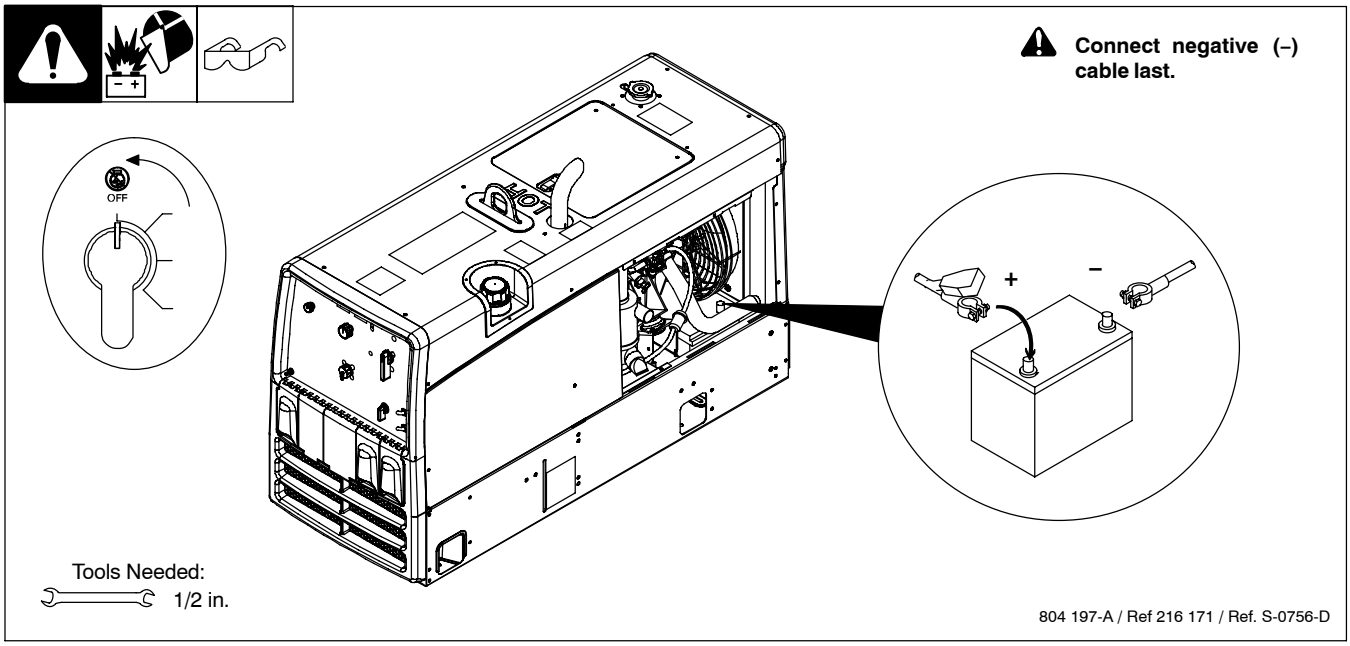
⚠ **Do not blow exhaust toward right side of unit where air inlet is or air cleaner may require frequent service. Point exhaust pipe in desired direction but always away from front panel and direction of travel.**

Tools Needed:

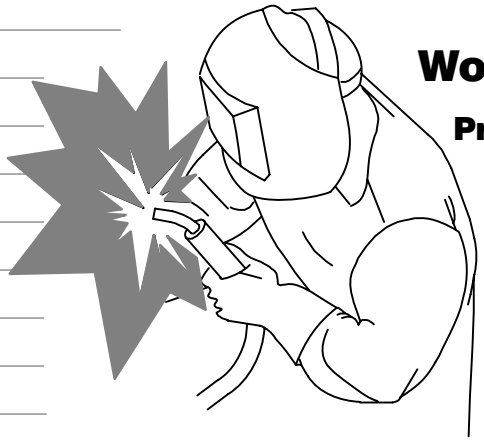
1/2 in.

804 196-A / Ref 216 171-B

5-5. Connecting the Battery



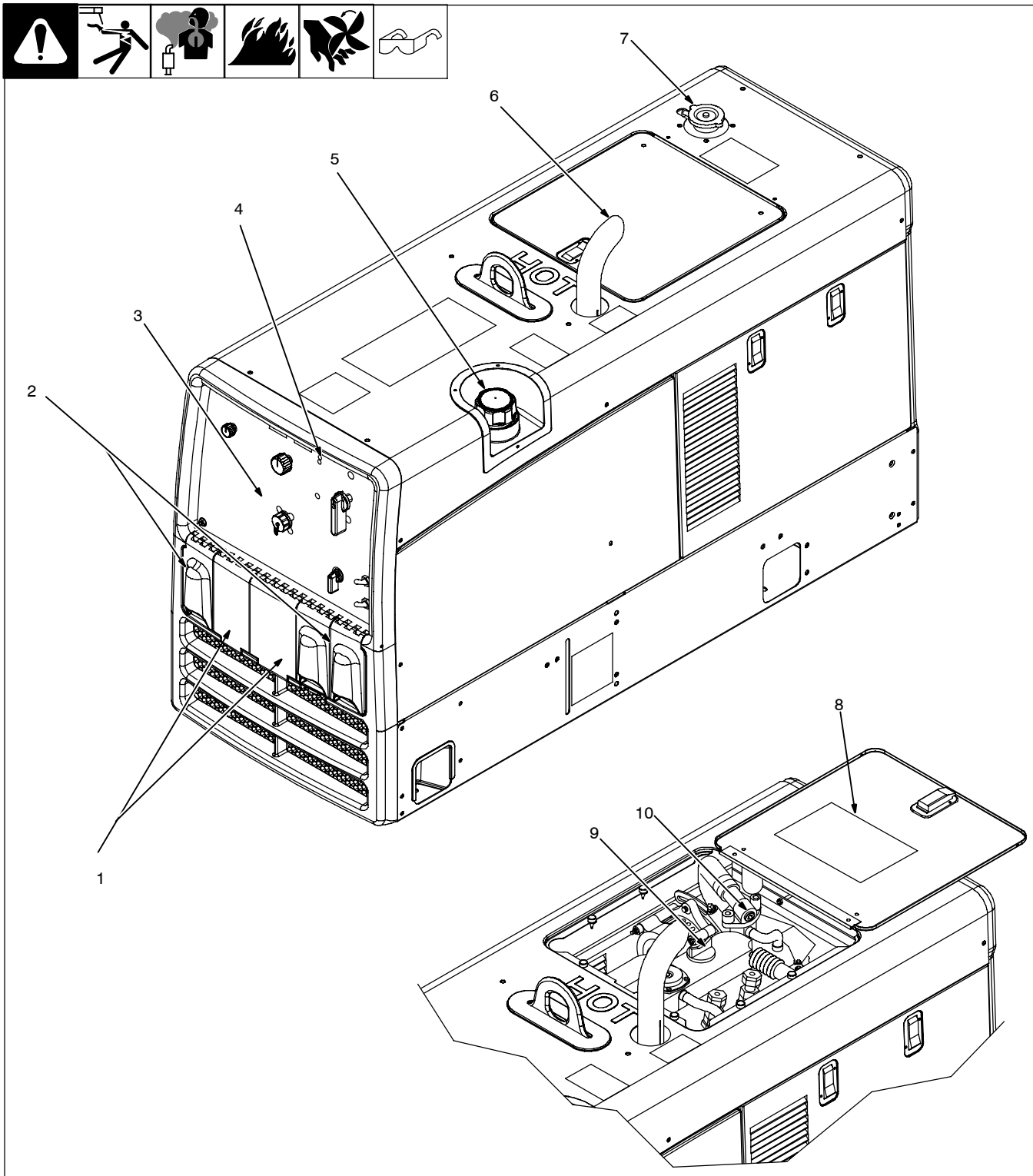
Notes



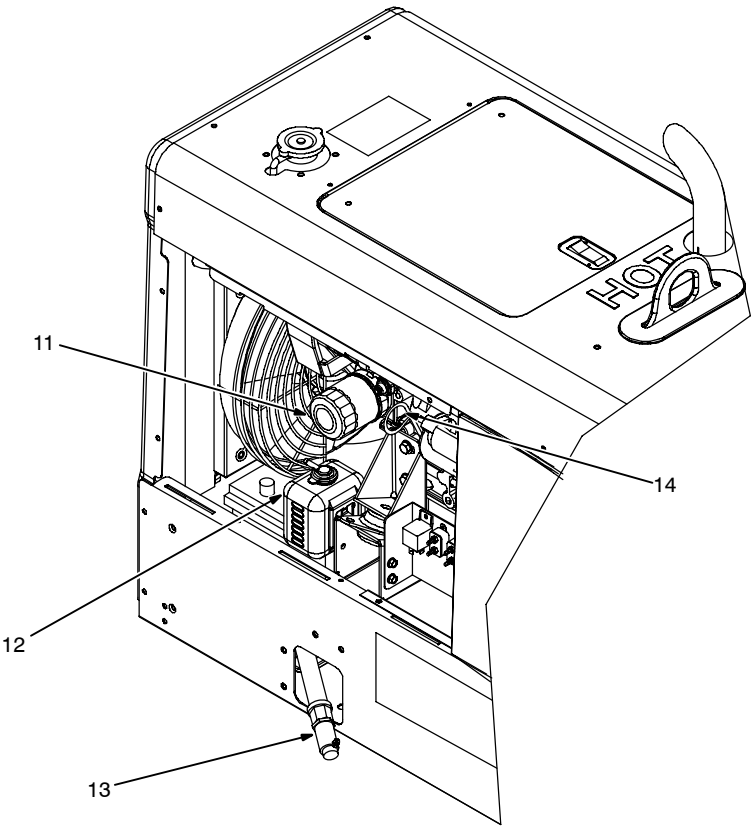
Work like a Pro!

Pros weld and cut safely. Read the safety rules at the beginning of this manual.

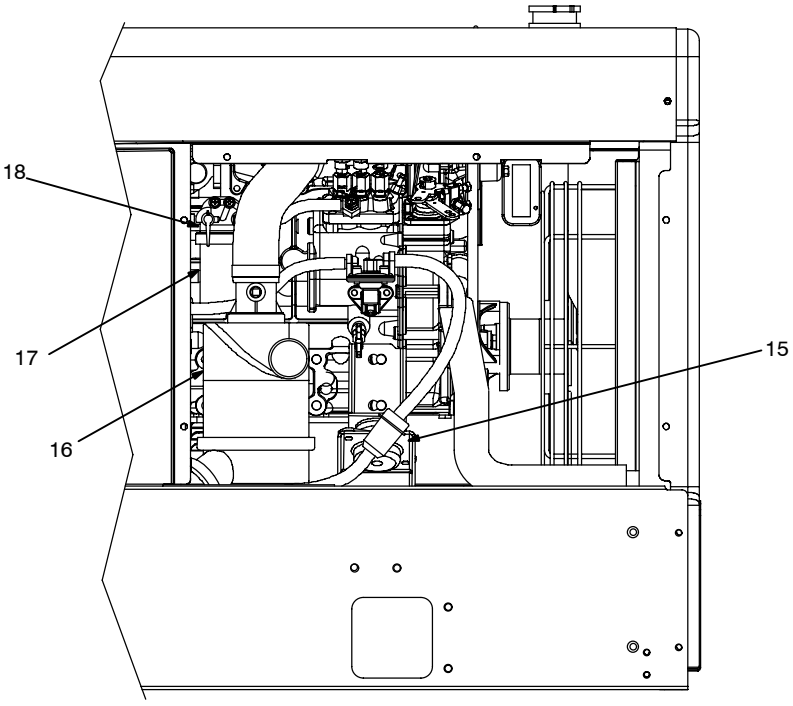
5-6. Overview And Engine Prestart Checks



1 Generator Power Receptacles (see Section 7)
2 Weld Output Terminals (see Section 5-7)
3 Operator Controls (see Section 6)
4 Fuel Level Indicators
5 Fuel Filler Cap
6 Exhaust Pipe
7 Radiator Cap
8 Engine Maintenance Label (Inside Door)
9 Oil Fill Cap
10 Thermostat Housing Plug
11 Oil Filter
12 Coolant Overflow Bottle
13 Oil Drain
14 Oil Dipstick
15 Inline Fuel Filter
16 Air Cleaner
17 Fuel Filter
18 Fuel Shut Off Valve



Engine Left Side



Engine Right Side

⚠ **Engine shown with doors removed. Doors must be in place when engine is running.**

Engine must be cold and on a level surface. See maintenance label (Section 8-3) for fluid specifications.

Starting engine for the first time:

Add fresh fuel to bottom of filler neck. Open fuel shut-off valve.

If coolant level is below bottom of radiator filler neck, add coolant to overflow bottle.

Run-in period (first 100 hours):

Engine may use oil and wetstacking may occur during run-in (see Section 11). Check oil several times daily during run-in.

Daily pre-start checks:

Add fresh fuel to bottom of filler neck.

Check oil. If oil is not up to full mark on dipstick, add oil. Unit is shipped with 10W30 engine oil.

Check coolant level in overflow bottle. If coolant is below Low level, add coolant until level in bottle is between Low and Full levels. If overflow bottle coolant level was low, check coolant level in radiator (see Section 8-3).

Engine damage can result from:

- Low oil level
- High engine temperature
- Incorrect coolant mixture
- Running out of fuel (air in fuel lines)
- Using gasoline
- Using ether to start engine
- Wetstacking

Engine stops if oil pressure is low, engine coolant temperature is high, or fuel level is low. Some conditions may cause engine damage before the engine shuts down.

Oil: Check oil level often and do not use the oil pressure shutdown system to monitor oil level.

Engine Temperature: Incorrect engine temperature can damage engine. Do not run engine without a properly working thermostat and radiator cap.

Keep radiator and air intake clean.

Coolant: A solution of 50% ethylene glycol base antifreeze and 50% water must be used in this engine. Do not use 100% antifreeze or severe damage will occur.

Fuel: Engine will shut down if fuel level is low. Air in fuel system causes starting problems.

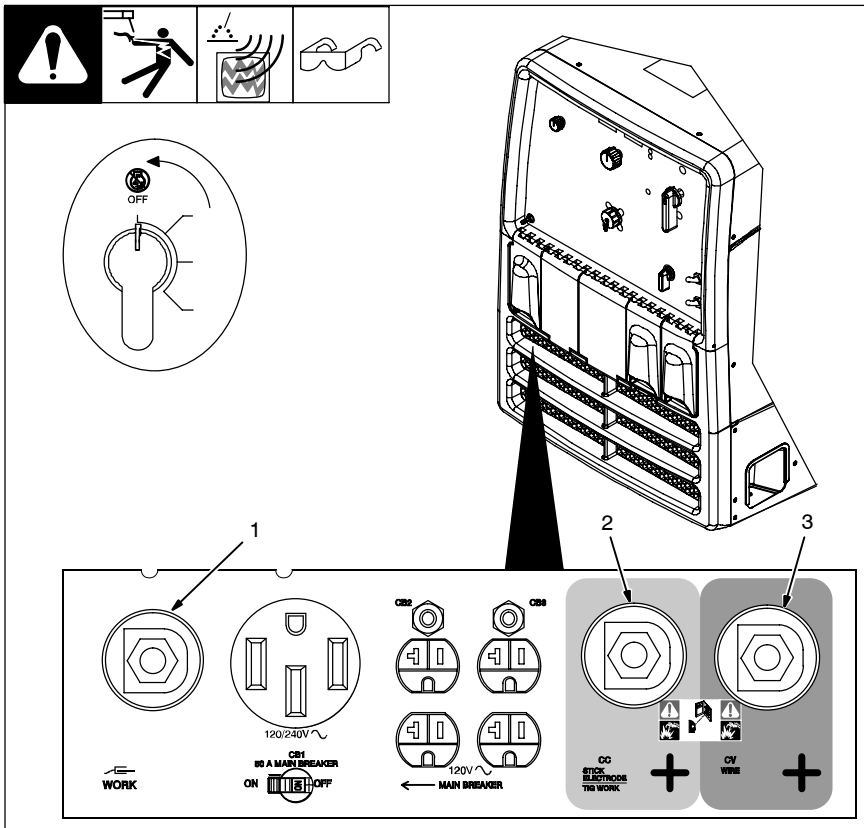
Do not use gasoline. Using ether voids warranty.

Wetstacking: If unburned fuel and oil collect in exhaust pipe during run-in, see Section 11.

☞ *To improve cold weather starting:*
Keep battery in good condition. Store battery in warm area.
Use fuel formulated for cold weather (diesel fuel can gel in cold weather). Contact local fuel supplier for fuel information.
Use correct grade oil for cold weather.

804 195-A / 804 197-A

5-7. Weld Output Terminals



⚠ **Do not connect to CC and CV terminals at the same time.**

1 Work Weld Output Terminal

2 Stick/TIG (CC) Weld Output Terminal

3 Wire /CV Weld Output Terminal

For MIG welding, connect work cable to Work terminal and wire feeder cable to Wire (CV) terminal.

For Stick/TIG welding, connect work cable to Work terminal and electrode holder/TIG torch cable to Stick/TIG (CC) terminal.

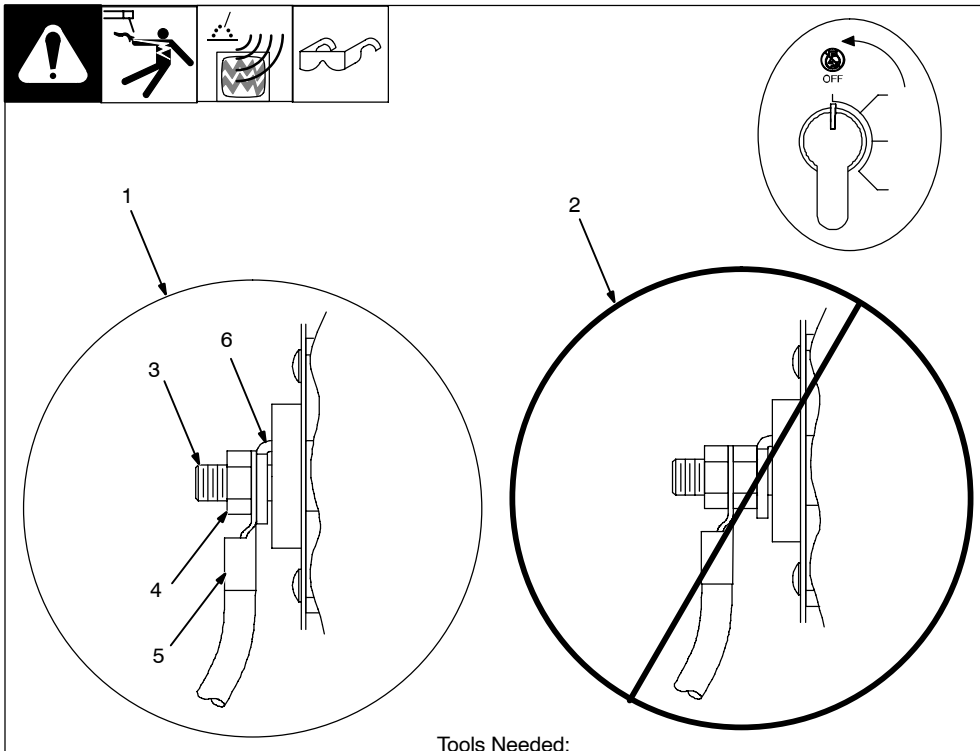
Use Process Selector switch to select type of weld output (see Section 6-3).

Tools Needed:

3/4 in.

804 195-A

5-8. Connecting To Weld Output Terminals



⚠ **Stop engine.**

⚠ **Failure to properly connect weld cables may cause excessive heat and start a fire, or damage your machine.**

☞ *Do not place anything between weld cable terminal and copper bar. Make sure that the surfaces of the weld cable terminal and copper bar are clean.*

1 Correct Weld Cable Connection

2 Incorrect Weld Cable Connection

3 Weld Output Terminal

4 Supplied Weld Output Terminal Nut

5 Weld Cable Terminal

6 Copper Bar

Remove supplied nut from weld output terminal. Slide weld cable terminal onto weld output terminal and secure with nut so that weld cable terminal is tight against copper bar.

Tools Needed:

3/4 in.

803 778-B

5-9. Selecting Weld Cable Sizes*

NOTICE *– The Total Cable Length in Weld Circuit (see table below) is the combined length of both weld cables. For example, if the power source is 100 ft (30 m) from the workpiece, the total cable length in the weld circuit is 200 ft (2 cables x 100 ft). Use the 200 ft (60 m) column to determine cable size.*

Weld Output Terminals

Turn off power before connecting to weld output terminals.

Do not use worn, damaged, undersized, or poorly spliced cables.

Welding Amperes	Weld Cable Size** and Total Cable (Copper) Length in Weld Circuit Not Exceeding***							
	100 ft (30 m) or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
	10 – 60% Duty Cycle	60 – 100% Duty Cycle	10 – 100% Duty Cycle					
100	4 (20)	4 (20)	4 (20)	3 (30)	2 (35)	1 (50)	1/0 (60)	1/0 (60)
150	3 (30)	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	3/0 (95)
200	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	4/0 (120)
250	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 2/0 (2x70)
300	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 3/0 (2x95)
350	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)
400	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)	2 ea. 4/0 (2x120)
500	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)	3 ea. 3/0 (3x95)	3 ea. 3/0 (3x95)

* This chart is a general guideline and may not suit all applications. If cable overheats, use next size larger cable.

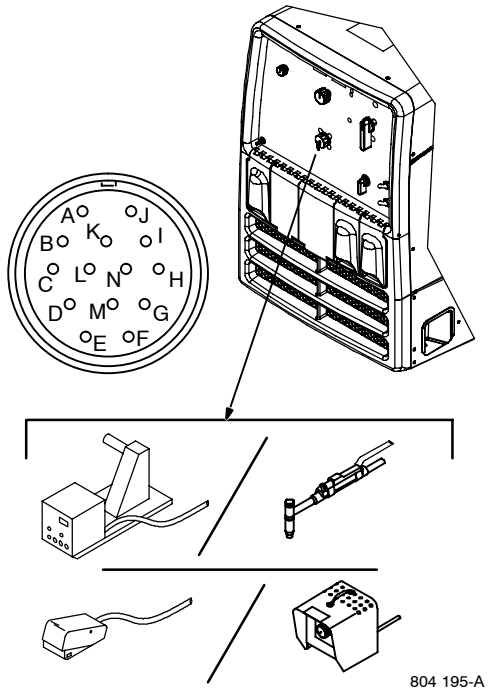
**Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere.
( ) = mm^2 for metric use

***For distances longer than those shown in this guide, call a factory applications rep. at 920-735-4505 (Miller) or 1-800-332-3281 (Hobart)

Ref. S-0007-G 2009–08

5-10. Remote Receptacle Information

☞ *Engine runs at weld/power speed whenever a device connected to the remote receptacle is running.*

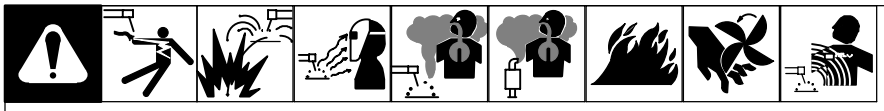


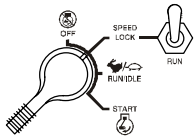
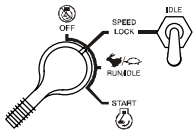
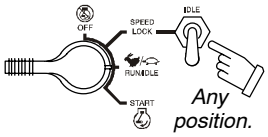
REMOTE 14	Socket*	Socket Information
24 VOLTS AC OUTPUT (CONTACTOR)	A	24 volts AC.
	B	Contact closure to A completes 24 volt AC contactor control circuit and keeps engine at Run speed in MIG mode. Protected by supplementary protector CB4.
115 VOLTS AC OUTPUT (CONTACTOR)	I	115 volts AC. Protected by supplementary protector CB3.
	J	Contact closure to I completes 115 volts AC contactor control circuit.
REMOTE OUTPUT CONTROL	C	+10 volts DC output to remote control.
	D	Remote control circuit common.
	E	0 to +10 volts DC input command signal from remote control.
A/V AMPERAGE VOLTAGE	F	Current feedback: 1 volt per 100 amperes.
	H	Voltage feedback: 1 volt per 10 arc volts.
GND	G	Circuit common for 24 and 115 volts AC circuits.
	K	Chassis common.

*The remaining sockets are not used.

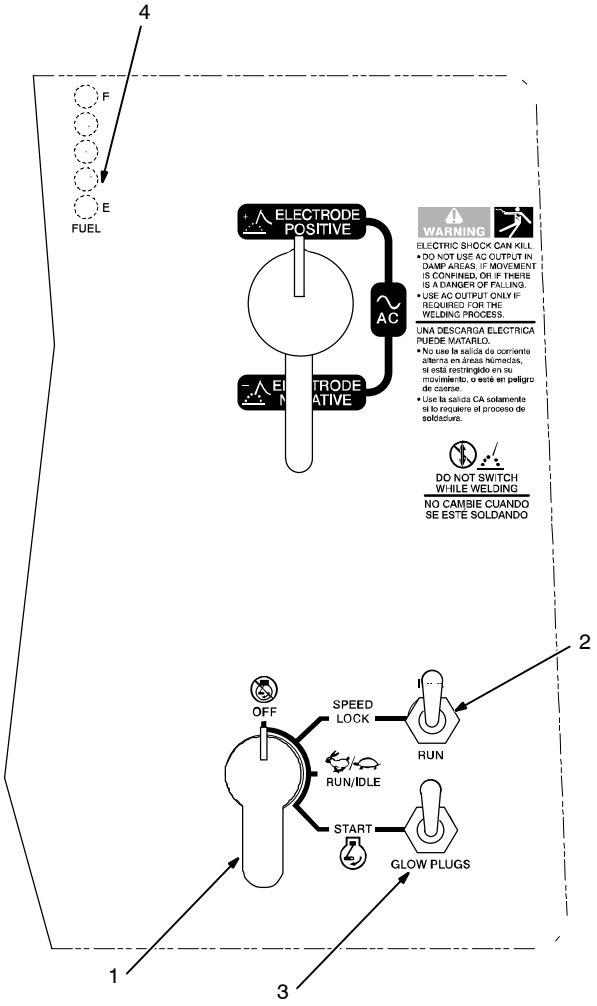
SECTION 6 – OPERATING THE WELDING GENERATOR

6-1. Engine Control Switches



Controlling Engine Speed	
	2450 rpm (Idle Speed) Continuous
	3750 rpm max (Weld/Power Speed) Continuous. Use in welding applications where high speed is needed for better arc starting and in TIG applications using a high frequency arc starter.
 *Any position.*	No Load: 2450 rpm (Idle Speed) Load: 3750 rpm max (weld/Power Speed)

Glow Plug Time	
°F	t
70°F (21°C)	0 seconds
32°F (0°C)	10 seconds
–4°F (–20°C)	20 seconds
Do not use glow plugs longer than 20 seconds. Do not use ether to start engine. Using ether voids warranty.	


4
F
E
FUEL
ELECTRODE POSITIVE
AC
WARNING
ELECTRIC SHOCK CAN KILL.
• DO NOT USE AC OUTPUT IN DAMP AREAS, IF MOVEMENT IS CONFINED, OR IF THERE IS A DANGER OF FALLING.
• USE AC OUTPUT ONLY IF REQUIRED FOR THE WELDING PROCESS.
UNA DESCARGA ELECTRICA PUEDE MATARLO.
• No use la salida de corriente alterna en áreas húmedas, si está restringido en su movimiento, o esté en peligro de caerse.
• Use la salida CA solamente si lo requiere el proceso de soldadura.
DO NOT SWITCH WHILE WELDING
NO CAMBIE CUANDO SE ESTÉ SOLDANDO
2
OFF
SPEED LOCK
RUN/IDLE
START
IDLE
RUN
GLOW PLUGS
1
3

Ref. 240 604

1 Engine Control Switch

Use switch to start engine, select speed, and stop engine. In Run/Idle position, engine runs at idle speed at no load, and weld/power speed under load. In Speed Lock position, engine speed is determined by position of Speed Lock switch (see item 2 and engine speed table above).

☞ *Place Engine Control switch in Speed Lock position and Speed Lock switch in Run position for TIG (GTAW) welding using a high frequency device.*

☞ *In MIG mode, the unit will not return to idle speed when the remote contactor is on (closure between pins A and B or I and J on remote receptacle).*

2 Speed Lock Switch

Use switch to lock engine in idle or weld/power speed when Engine Control switch is in the Speed Lock position. The Speed Lock switch is not needed at start-up. The engine always starts at idle speed.

With switch in the Idle position and Engine Control switch in Speed Lock, the engine runs at idle speed. With switch in Run position and Engine Control switch in Speed Lock, engine runs at weld/power speed.

Speed Lock switch does not affect engine speed when Engine Control switch is in Run/Idle position. (Engine speed changes with load.)

3 Glow Plug Switch

If necessary, push switch down before start-up to activate glow plug. See glow plug table above for operating information.

To Start: Use glow plug switch if necessary (see item 3 and glow plug table). Turn engine control switch to Start. Release engine control switch when engine starts.

☞ *If the engine does not start, let the engine come to a complete stop before attempting restart.*

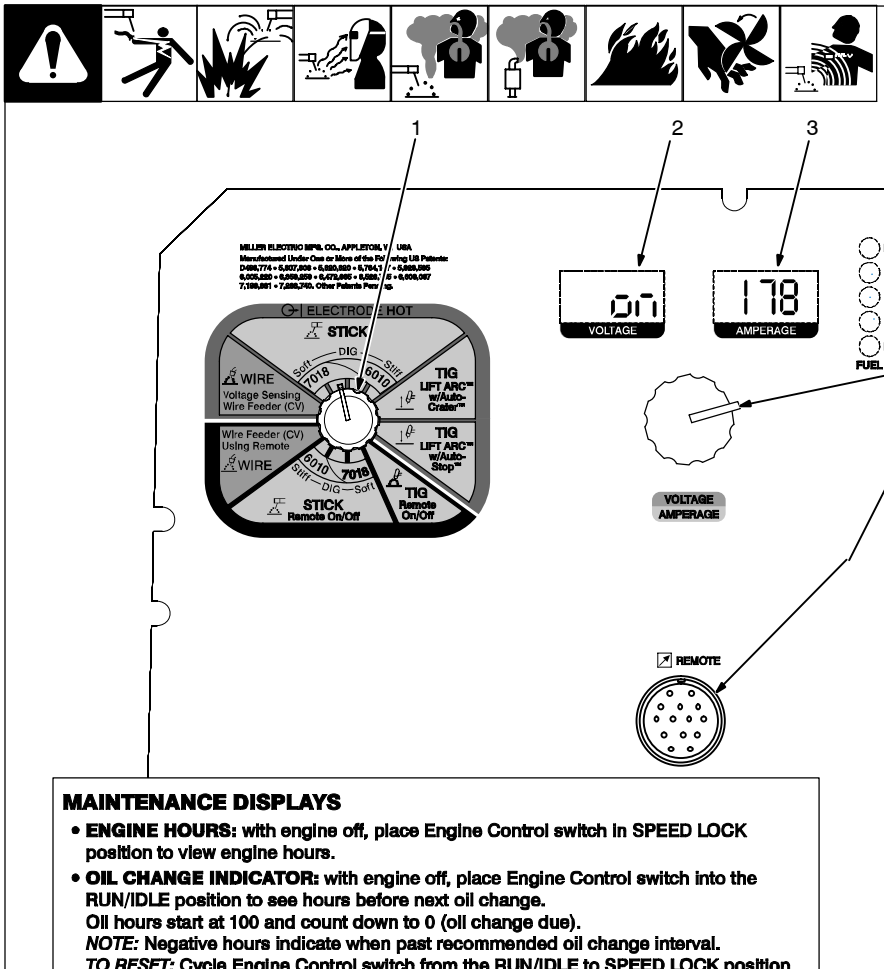
To Stop: Turn Engine Control switch to Off position.

☞ *Close fuel valve to stop engine if Engine Control switch does not work (see Section 5-6).*

4 Fuel Level Indicator

With Engine Control switch in the Speed Lock or Run/Idle position, LED's indicate fuel level left in tank.

6-2. Weld Output Controls



MAINTENANCE DISPLAYS

- **ENGINE HOURS:** with engine off, place Engine Control switch in SPEED LOCK position to view engine hours.
- **OIL CHANGE INDICATOR:** with engine off, place Engine Control switch into the RUN/IDLE position to see hours before next oil change.
  Oil hours start at 100 and count down to 0 (oil change due).
  NOTE: Negative hours indicate when past recommended oil change interval.
  TO RESET: Cycle Engine Control switch from the RUN/IDLE to SPEED LOCK position 3 times.
- **LOW FUEL SHUTDOWN:** Engine will shut off prior to running out of fuel to prevent loss of fuel in the system. Display will read: noFUEL. Turn the machine off, add fuel, and restart.
- **HIGH COOLANT TEMPERATURE SHUTDOWN:** Engine will shut off and display will read: HI H20. See Owner's Manual for coolant information. Turn Engine Control switch OFF to reset shutdown.
- **LOW OIL PRESSURE SHUTDOWN:** Engine will shut off and display will read: LO OIL. Turn Engine Control switch OFF to reset shutdown.
- **ENGINE RPM's:** With engine running and the Process Selector switch in any Stick HOT position, cycle Engine Control switch from the RUN/IDLE to SPEED LOCK position 3 times and meters will display Engine RPM's. Use to check and set both idle and run speed RPM's. Accuracy is ±16 RPM's. Turn machine off to reset display.

Ref.240 604 / Ref. 225 915-A

1 Process/Contactor Switch

See Section 6-3 for Process/Contactor switch information.

2 And 3 Displays

Displays can show weld process information (voltage and amperage) or engine and maintenance information.

Meter Weld Functions: In Wire modes, Voltmeter displays preset weld voltage when not welding. Meters display actual voltage and amperage when welding and for five seconds after welding has stopped.

In Stick and TIG modes, Voltmeter reads ON and Ammeter displays preset amperage when the contactor is on and not welding. The Voltmeter reads 0 (zero) when in remote with the contactor off. Meters display actual voltage and amperage when welding and for five seconds after welding has stopped.

Meter Engine And Maintenance Functions: See inset from maintenance label.

If displays read: HLP_001, and engine does not return to idle, check throttle solenoid. Turn Engine Control switch to OFF to reset shutdown.

4 Voltage/Amperage Control

Use control to select weld voltage or amperage. Control may be adjusted while welding.

With Process/Contactor switch in any Stick or TIG setting, use control to adjust amperage. With Process/Contactor switch in any Wire position, use control to adjust voltage. When a remote voltage/amperage control is connected to Remote receptacle RC4, control sets the maximum amperage in Stick and TIG modes, but has no effect in MIG modes.

5 Remote Receptacle

Use receptacle to connect remote control or wire feeder.

When a remote voltage/amperage control is connected to the Remote receptacle, the Auto Sense Remote feature automatically switches voltage/amperage control to the remote control (see Sections 5-10 and 6-6).

With remote voltage/amperage control connected, weld output in CC mode is determined by a combination of front panel and remote control voltage/amperage settings. In CV mode, weld output is controlled through remote control only.

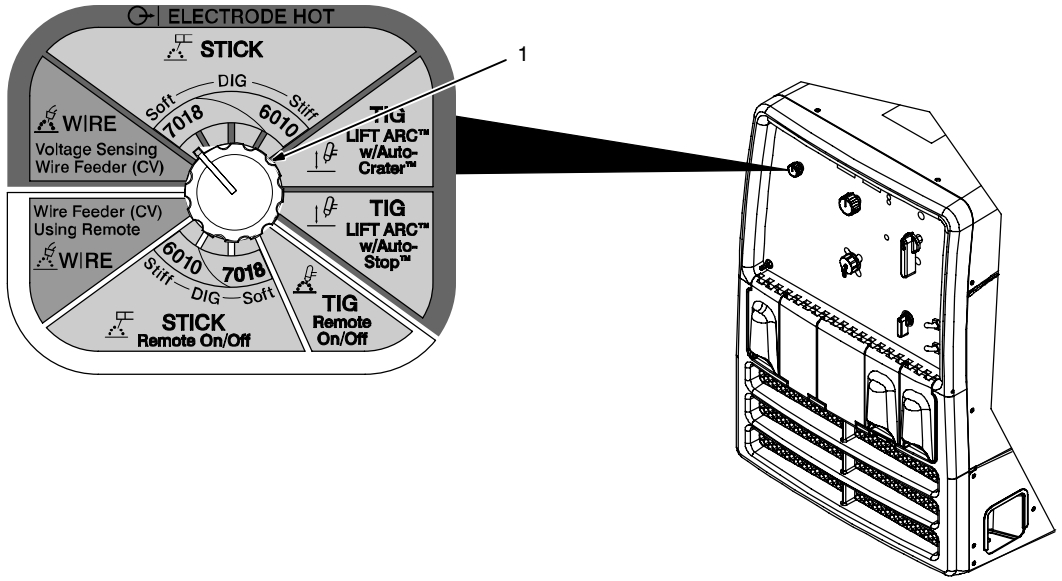
If no remote voltage/amperage control is connected to the Remote receptacle, the front panel Voltage/Amperage control adjusts voltage and amperage.

6 DC Polarity/AC Switch

NOTICE – *Do not switch while welding.*

Use switch to select AC weld output or polarity of DC weld output.

6-3. Process/Contactor Switch



804 195 / 240 604

1 Process/Contactor Switch

⚠ **Weld output terminals are energized when Process/Contactor switch is in an Electrode Hot position and the engine is running.**

☞ *The unit will not return to idle speed when Process/Contactor switch is in a Wire position and the remote contactor is on (closure between pins A and B on remote receptacle).*

Use switch to select weld process and weld output on/off control (see table below and Section 5-10).

Place switch in Remote positions to turn weld output on and off with a device connected to the remote receptacle.

Place switch in Electrode Hot positions for weld output to be on whenever the engine is running.

Wire Positions:

Use Wire positions for MIG welding using a voltage sensing wire feeder (Electrode Hot) or wire feeder using remote control.

Stick Positions:

Use Stick positions for stick (SMAW) and air carbon arc (CAC-A) cutting and gouging.

Stick Electrode Hot:

When switch is in a Stick Electrode Hot mode, select one of four dig settings to provide additional amperage during short arc length conditions and help prevent electrodes from “sticking”. See Stick position descriptions following (reading L to R):

Soft Arc (E 7018) - This setting provides a low dig/arc force setting for smooth weld performance. A stable weld puddle with little arc “snap” gives excellent weld bead appearance with minimal spatter.

Medium Soft Arc - This setting provides a low to medium dig/arc force that gives a slightly more fluid weld puddle, more arc “snap”, and reduces the potential for electrode sticking at shorter arc lengths.

Medium Stiff Arc - This setting provides medium dig/arc force for open root vertical up joints or joints that do not require additional current for fit up inconsistencies.

Stiff Arc (E6010) - This setting provides a high dig/arc force for open root vertical down joints where additional current is needed to compensate for tight joint fit up without the need to increase overall welding current. This setting is recommended for those who prefer a very stiff arc with 6010 electrodes.

Stick Remote On/Off:

When switch is in a Stick Remote On/Off mode, select one of three settings to provide additional amperage during short arc length conditions and help prevent electrodes from “sticking”. See Stick position descriptions following (readingR to L):

Soft Arc (E7018) - This setting provides a low to medium dig/arc force that gives a slightly more fluid weld puddle, more arc “snap”, and reduces the potential for electrode sticking at shorter arc lengths.

Medium Arc - This setting provides medium dig/arc force for open root vertical up joints or joints that do not require additional current for fit up inconsistencies.

Stiff Arc (E6010) - This setting provides a high dig/arc force for open root vertical down joints where additional current is needed to compensate for tight joint fit up without the need to increase overall welding current. This setting is recommended for those who prefer a very stiff arc with 6010 electrodes.

The dig circuit is disabled when switch is in Wire or TIG positions.

TIG Positions:

TIG – Remote On/Off – Use this position for AC or DC TIG welding using remote on/off control.

Electrode Hot – Lift-Arc™ w/Auto Crater™ TIG (DC only) - With switch in this position, a low voltage (10 V DC) is present between the electrode and workpiece preventing overheating, sticking, or contamination of the electrode (see Section 6-5) as the arc is struck.

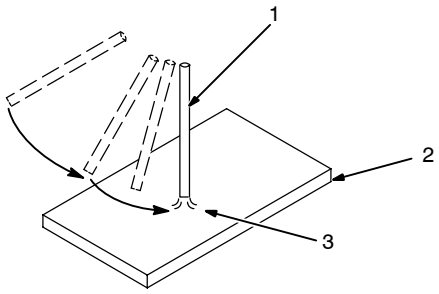
End the arc using the Auto-Crater feature (see Section 6-5).

Electrode Hot – Lift-Arc™ w/Auto Stop™ TIG (DC only) - With switch in this position, a low voltage (10 V DC) is present between the electrode and workpiece preventing overheating, sticking, or contamination of the electrode (see Section 6-5) as the arc is struck.

End the arc using the Auto-Stop feature (see Section 6-5).

Process/Contactor Switch Settings		
Switch Setting	**Process**	**Output On/Off Control**
Electrode Hot – Wire	MIG (GMAW)	Electrode Hot
Electrode Hot – Stick	Stick (SMAW) Select Preferred Dig	Electrode Hot
Electrode Hot – Stick	Air Carbon Arc (CAC-A) Cutting And Gouging Select Any Dig	Electrode Hot
Electrode Hot – Lift Arc w/Auto-Crater	TIG (GTAW) Lift Arc w/Auto-Crater (GTAW) (DC Only)	Electrode Hot
Electrode Hot – Lift Arc w/Auto-Stop	TIG (GTAW) Lift Arc w/Auto-Stop (GTAW) (DC Only)	Electrode Hot
TIG – Remote On/Off	TIG (GTAW) With HF Unit Or Remote Control (AC or DC)	At Remote Receptacle
Stick – Remote On/Off	Stick (SMAW) With Remote On/Off	At Remote Receptacle
Wire – Wire Feeder (CV) Using Remote	MIG (GMAW)	At Remote Receptacle

6-4. Stick Start Procedure – Scratch Start Technique



With Stick selected, start arc as follows:

1 Electrode

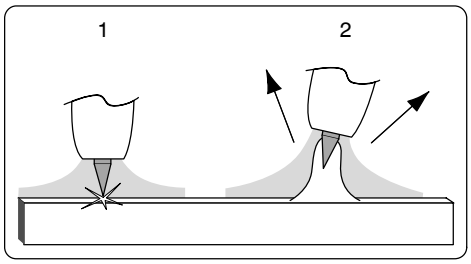
2 Workpiece

3 Arc

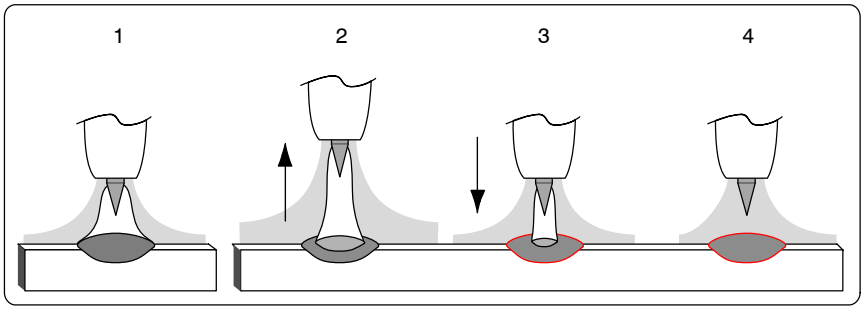
Drag electrode across workpiece like striking a match; lift electrode slightly after touching work. If arc goes out electrode was lifted to high. If electrode sticks to workpiece, use a quick twist to free it.

6-5. Lift-Arc™ TIG With Auto-Crater™ And Auto-Stop™

Arc Start With Lift-Arc

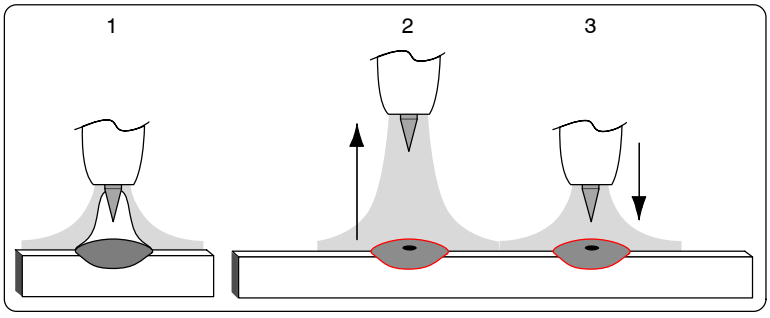


Arc End With Auto-Crater



OR

Arc End With Auto-Stop



Arc Start With Lift-Arc TIG

Lift-Arc is used for the DCEN GTAW process when HF Start method is not permitted.

Select Lift-Arc at Process/Contactor switch.

Turn gas on.

1 Touch or scratch.

2 Lift at any angle.

Touch tungsten electrode to workpiece at weld start point. Slowly lift electrode. Arc is started when electrode is lifted.

Maintain shielding gas coverage and eliminate tungsten and workpiece contamination by using Auto-Crater or Auto-Stop to end the arc.

Arc End With Auto-Crater:

☞ *Remote control is not needed when using Auto-Crater.*

1 While welding.

2 Lift torch slightly to start Auto-Crater end (current is reduced).

3 Lower torch. Weld current ramps down.

4 Shielding gas continues until shut off.

Arc End With Auto-Stop:

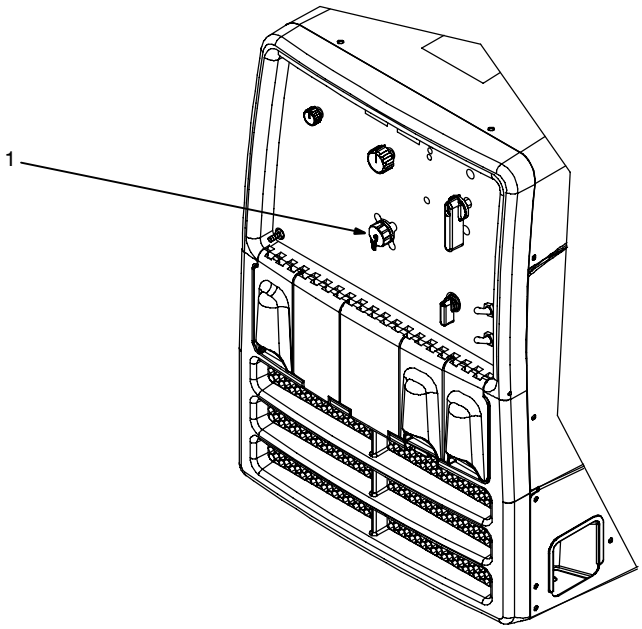
1 While welding.

2 Lift torch to start Auto-Stop. (Lift higher than that needed to start Auto-Crater.) Arc stops.

3 Move torch back down to maintain gas coverage and prevent contamination.

WM Marketing

6-6. Remote Amperage Control



1 Remote Receptacle RC4

Connect optional remote voltage/amperage (V/A) control to RC4 (see Section 5-10).

With remote control connected, weld output in a CC mode (Stick, TIG) is determined by a combination of front panel and remote control voltage/amperage settings. In CV mode (Wire), weld output is controlled through remote control only.

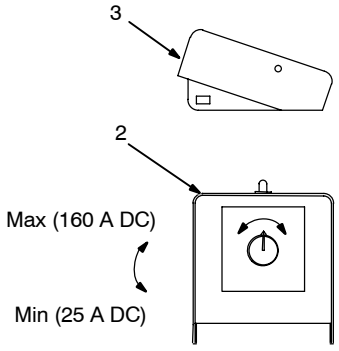
2 Remote Hand Control (Optional)

3 Remote Foot Control (Optional)

☞ *Engine runs at weld/power speed in Wire mode whenever a device connected to the remote receptacle makes closure between pins A and B. In all other modes, the engine runs at idle speed until a load is applied.*

In Example:
Process = Stick (Using Remote On/Off)
Min = 25 A CC/DC
Max = 160 A CC/DC

Connect Remote V/A Control To Remote Receptacle RC4 → Select Polarity By Using DC Polarity/AC Switch Or By Changing Cable Connections → Set V/A Control (Mid-Range: About 160 A) →

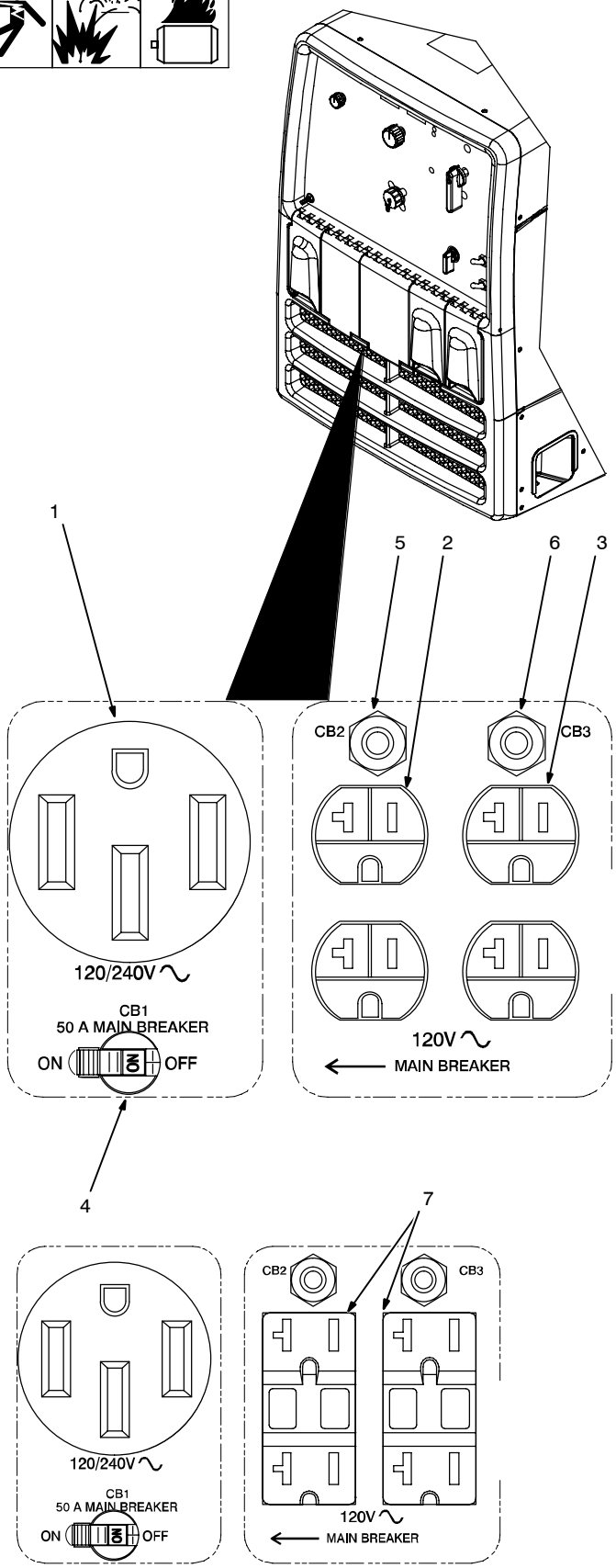


Adjust Remote V/A Control (Stick Welding Only)

804 197-A / 216 171–A / S-0769 / S-0774

SECTION 7 – OPERATING AUXILIARY EQUIPMENT

7-1. Generator Power Receptacles



If unit does not have GFCI receptacles, use GFCI-protected extension cord.

☞ *Generator power decreases as weld current increases.*

1 240 V 50 A AC Receptacle RC1

RC1 supplies 60 Hz single-phase power at weld/power speed. Maximum output is 11 kVA/kW. See Section 7-3 for information on wiring optional 240 V single-phase plug.

2 120 V 20 A AC Duplex Receptacle RC2

3 120 V 20 A AC Duplex Receptacle RC3

RC2 and RC3 supply 60 Hz single-phase power at weld/power speed. Maximum output from RC2 or RC3 is 2.4 kVA/kW.

4 Supplementary Protector CB1

CB1 protects receptacles RC1, RC2, and RC3 from overload. If CB1 opens, the receptacles do not work. Place switch in On position to reset breaker.

5 Supplementary Protector CB2

6 Supplementary Protector CB3

CB2 protects RC2 and CB3 protects RC3 from overload. If a supplementary protector opens, the receptacle does not work.

☞ *Press button to reset. If supplementary protector continues to open, contact Factory Authorized Service Agent.*

Power is still present at the 240 volt receptacle when CB2 and/or CB3 trips.
Unplug power cord before attempting to service accessories or tools.

7 Optional 120 V 20 A AC GFCI Receptacles GFCI-2 and GFCI-3

GFCI2 and GFCI3 supply 60 Hz single-phase power at weld/power speed. Maximum output from GFCI-2 or GFCI-3 is 2.4 kVA/kW. Circuit protection is the same as standard receptacles.

If a ground fault is detected, the GFCI Reset button pops out and the circuit opens to disconnect the faulty equipment. Check for damaged tools, cords, plugs, etc. connected to the receptacle. Press button to reset receptacle and resume operation.

☞ *At least once a month, run engine at weld/power speed and press Test button to verify GFCI is working properly.*

Combined output of all receptacles limited to 11 kVA/kW rating of the generator.

EXAMPLE: If 20 A is drawn from each 120 V duplex receptacle, only 25 A is available at the 240V receptacle:

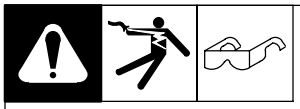
2 x (120 V x 20 A) + (240 V x 25 A) = 11 kVA/kW

Ref 804 195-A / Ref 216 171-B

7-2. Simultaneous Weld And Power

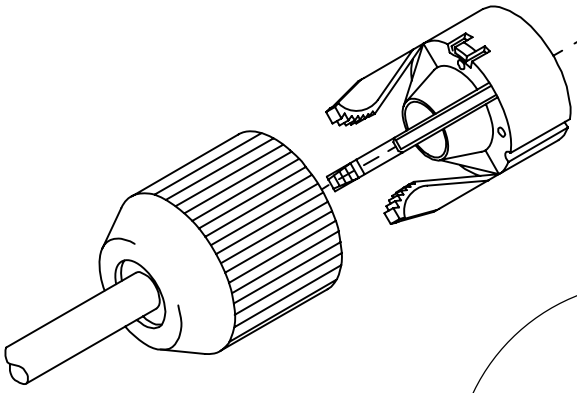
Weld Current in Amperes	Total Power in Watts	120 V Full kVA Receptacle Amperes	240 V Full kVA Receptacle Amperes
300	1000	10	5
250	3500	31	15
200	5200	46	23
150	6700	60	30
100	8000	70	35
0	11,000 (Peak)	88	44

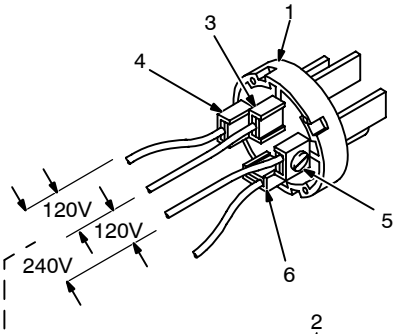
7-3. Wiring Optional 240 Volt Plug

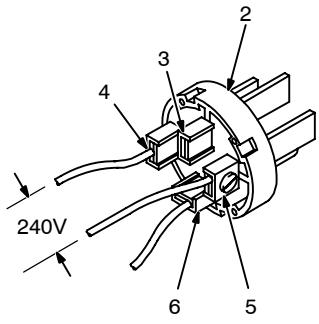


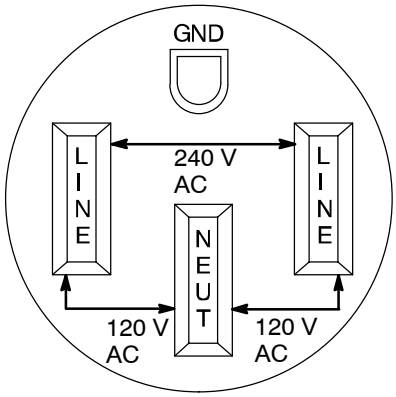
Current Available in Amperes	
240 V Receptacle*	Each 120 V Duplex Receptacle
42	0
37	5
32	10
27	15
22	20
V x A = Watts	
*One 240 V load or two 120 V loads.	

7









The plug can be wired for a 240 V, 2-wire load or a 120/240V, 3-wire load. See circuit diagram.

1 Plug Wired for 120/240 V, 3-Wire Load

When wired for 120 V loads, each duplex receptacle shares a load with one half of 240 V receptacle.

2 Plug Wired for 240 V, 2-Wire Load

3 Neutral (Silver) Terminal

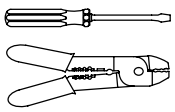
4 Load 1 (Brass)Terminal

5 Load 2 (Brass) Terminal

6 Ground (Green) Terminal

7 Amperes Available using 120/240 V Plug

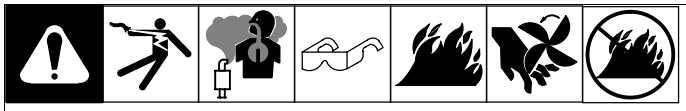
Tools Needed:



plug1 11/03 – 120 813-D

SECTION 8 – MAINTENANCE AND TROUBLESHOOTING

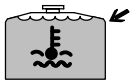
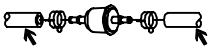
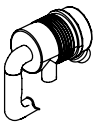
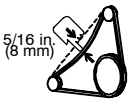
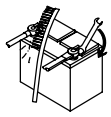
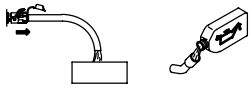
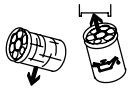
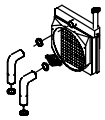
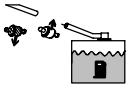
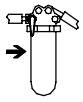
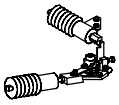
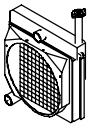
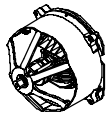
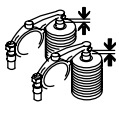
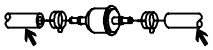
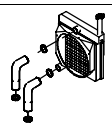
8-1. Routine Maintenance



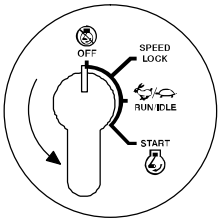
Recycle engine fluids.

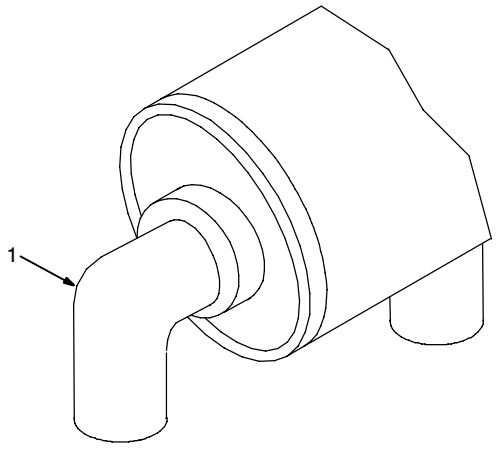
Stop engine before maintaining.

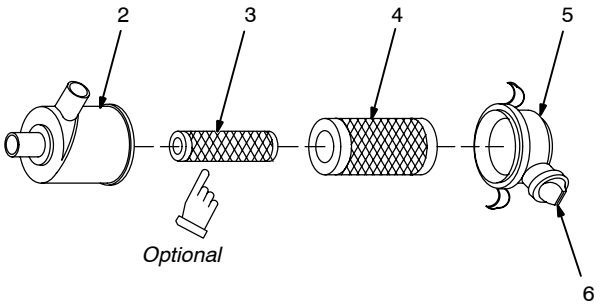
☞ *See Engine Manual and Maintenance Label for important start-up, service, and storage information. Service engine more often if used in severe conditions.*

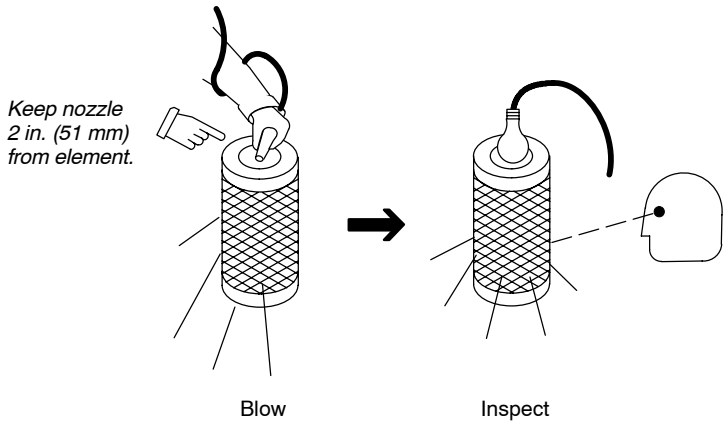
	✓ = Check ◇ = Change ◯ = Clean ☆ = Replace ***** To be done by Factory Authorized Service Agent				Reference
Every **8** Hours	 ✓ Coolant Level	 ✓ Fuel Level	 ✓ Oil Level	 ◯ Oil, Fuel Spills	Section 5-6
Every **50** Hours	 ✓ Fuel Connections	 ✓ Fuel Connections	 ◯ Weld Terminals		
Every **100** Hours	 ◯ Air Cleaner Element	 ✓ Air Cleaner Hoses	 5/16 in. (8 mm) ✓ Belt Tension	 ◯ Battery Terminals	Section 8-3, 8-2, Engine Manual
	 ◇ Oil				
Every **200** Hours	 ◇ Oil Filter	 ✓ Radiator Hoses	 ☆ Unreadable Labels	 ◇ Inline Fuel Filter	Engine Manual, Section 8-4
	 ◇ Fuel Filter	 ✓ Engine Speed			
Every **500** Hours	 ✓ Fan Belt	 ◯ Flush Radiator	 ✓☆ Weld Cables	 ✓ Slip Rings* ✓ Brushes* ☆ 1500 Hours*	Engine Manual, Section 8-3
Every **800** Hours	 ✓ Valve Clearance*				Section 8-3
Every **2000** Hours	 ✓☆ Fuel Hoses	 ✓☆ Fuel Hoses	 ✓☆ Coolant & Hoses		Section 8-3

8-2. Servicing Air Cleaner









Stop engine.

NOTICE *– Do not run engine without air cleaner or with dirty element. Engine damage caused by using a damaged element is not covered by the warranty.*

☞ *The air cleaner primary element can be cleaned but the dirt holding capacity of the filter is reduced with each cleaning. The chance of dirt reaching the clean side of the filter while cleaning and the possibility of filter damage makes cleaning a risk. Consider the risk of unwarrantable equipment damage when determining whether to clean or replace the primary element.*

If you decide to clean the primary element, we strongly recommend installing an optional safety element to provide additional engine protection. ***Never clean a safety element.*** *Replace the safety element after servicing the primary element three times.*

1 Intake Manifold

Clean or replace primary element if dirty (see note above before cleaning). **Replace** primary element if damaged. Replace primary element yearly or after six cleanings.

2 Housing

3 Safety Element (Optional)

4 Primary Element

5 Cover

6 Dust Ejector

To clean air filter:

Wipe off cover and housing. Remove cover and dump out dust. Remove element(s). Wipe dust from inside cover and housing with damp cloth. Reinstall safety element (if present). Reinstall cover.

NOTICE *– Do not clean housing with air hose.*

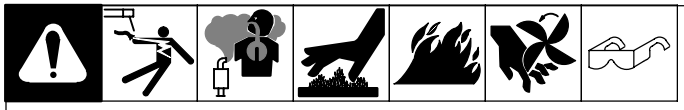
Clean primary element with compressed air only.

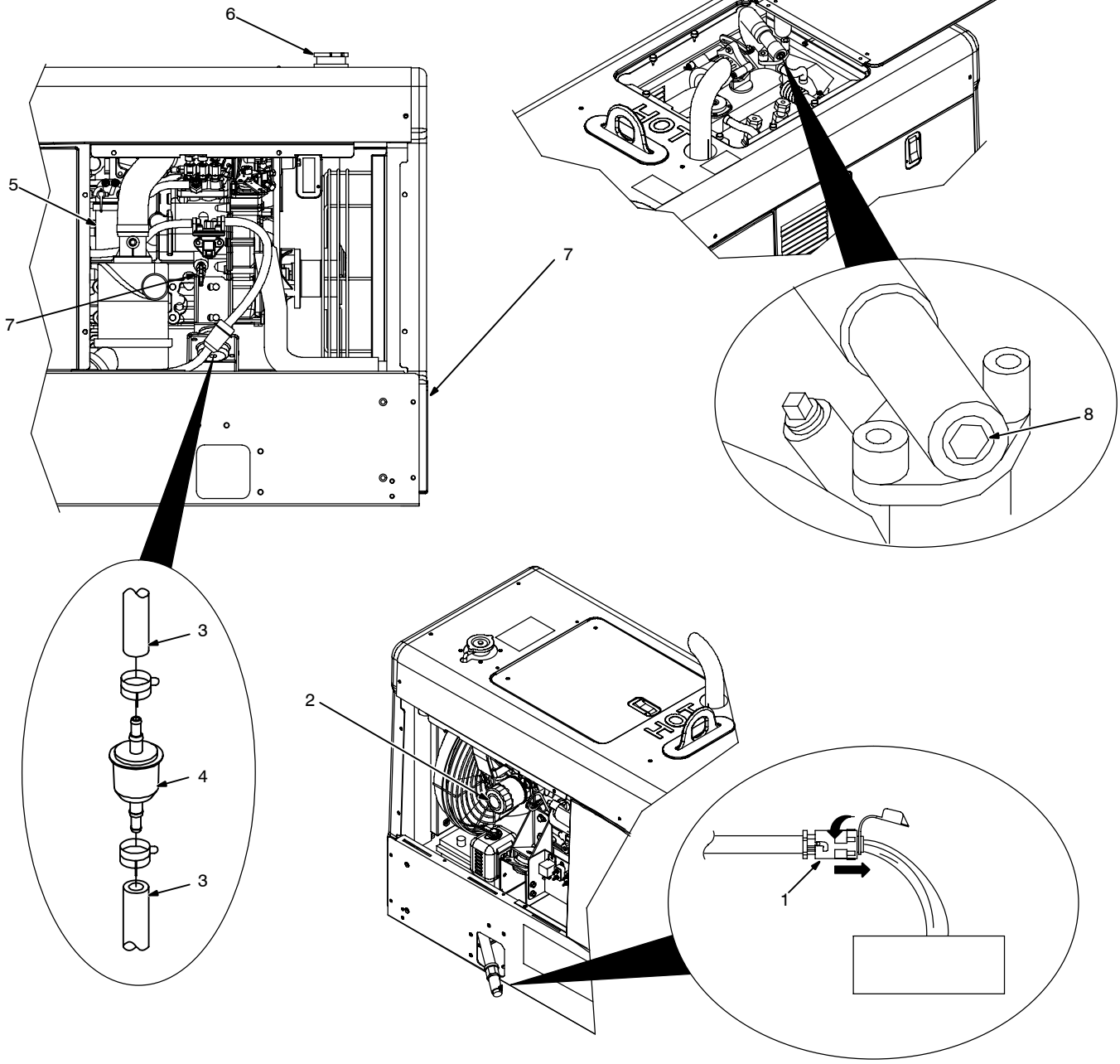
Air pressure must not exceed 100 psi (690 kPa). Use 1/8 in. (3 mm) nozzle and keep nozzle at least 2 in. (51 mm) from inside of element. Replace primary element if it has holes or damaged gaskets.

Reinstall primary element and cover (dust ejector down).

REF: aircleaner1 9/02– ST-153 929-B / ST-153 585 / Ref. S-0698-B

8-3. Maintenance Label And Engine Maintenance Activities





⚠ **Stop engine and let cool.**

Oil And Fuel

1 Oil Drain Valve

2 Oil Filter

Change engine oil and filter according to engine manual.

☞ *Close valve and valve cap before adding oil and running engine.*

Fill crankcase with new oil to full mark on dipstick (see Section 5-6).

3 Fuel Lines

Replace fuel lines if cracked or worn.

4 Inline Fuel Filter

Install new filter as shown.

5 Fuel Filter

Replace filter according to engine manual.

Wipe up any spilled fuel.

Start engine, and check for fuel leaks.

⚠ **Stop engine, tighten connections as necessary, and wipe up fuel.**

Coolant

6 Radiator Cap

7 Radiator Drain Cocks (One located on bottom of radiator)

Drain engine coolant according to procedure in engine manual.

Add engine coolant as follows:

8 Thermostat Housing Plug

Remove thermostat housing plug. Add coolant to radiator until coolant is at bottom of filler neck and coolant trickles out of thermostat housing plug hole. This ensures all air is purged from the system.

Reinstall plug and radiator cap. Check coolant level in overflow bottle.

Engine coolant is a mixture of water and ethylene glycol base antifreeze. A solution of 50% antifreeze and 50% water must be used in this engine. Do not use 100% antifreeze or severe damage will occur.

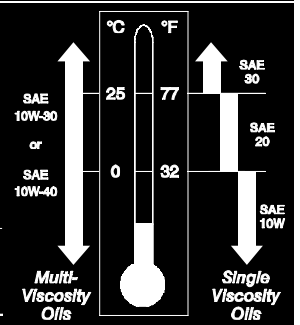
TRAILBLAZER KUBOTA D722 ENGINE

See Engine Manual for complete engine care.
Give Engine Specification and Serial Number when ordering parts.

Vea el manual del motor para el cuidado completo del motor.
Dé la especificación del motor y el número de serie cuando ordena partes o piezas.

Check daily.
Chequee Diariamente.

To Drain Oil:
Push And Turn CCW
1/2 in. ID Hose
Pull



Recommended Oil
API Service Classification. . . . CC/CD/CE or better
Oil Change . . . . . 100 hours or less
Oil Filter Change. . . . . normal conditions – 200 hours or less

Aceite Recomendado
Clasificación de Servicio API . CC/CD/CE o mejor
Cambio de aceite . . . . . 100 horas o menos
Cambio del filtro del aceite. . . Condiciones normales – 200 horas o menos

Oil Filter. . . . . MILLER 187443 Kubota 15853-32430
Hastings LF523 Fram PH3593A
Oil Capacity. . . . . 2.75 qt (2.6 L) or 3.0 qt (2.8 L) with filter change

Fuel Grade . . . . . 2-D Cetane No. 45 min. (.5% max. Sulfur content)
Primary Fuel Filter . . . . . MILLER 213858 Hastings GF160
Change filter every 200 hours. / Cambie el filtro cada 200 horas.
Secondary Fuel Filter Element . . . . MILLER 187442 Kubota 15231-43560
Fill filter with clean fuel before installing – read instructions on filter.
Llene el filtro con combustible limpio antes de instalar lea las instrucciones en el filtro.

Air Filter Service . . . . . 100 hours or less – see Owner's Manual
Servicio del filtro de aire. . . . . 100 horas o menos – vea el manual del dueño
Air Filter Element . . . . . MILLER 187441 Baldwin RS3715
Donaldson P822686 Wix 46449
Air Filter Element (Safety) Opt . . . MILLER 202102 Donaldson P535396

12 Volt Battery . . BCI Group 58
Cranking Performance at 0° F
(-18°C) . . . . . 430 Amps

Valve Clearance – Cold
Espacio de despeje de válvula fría
.0057 – .0072 in.
.145 – .185 mm

Engine RPM – No Load
Weld/Power . . . . 3700 +50 -25
Idle . . . . . 2450 +0 -75

Check Engine Speeds every 200 hours.
Chequee las velocidades del motor Cada 200 horas.

Engine Cooling
A solution of 50% anti-freeze and 50% water must be used in this engine. Do not use 100% anti-freeze, or severe damage will occur.

Enfriamiento del motor
Se debe usar una solución de 50% anticongelante con 50% de agua en este motor. No use 100% de anticongelante, porque ocurrirá daño severo al motor.

Inspect brushes and slip rings every 500 hours and replace the brushes every 1500 hours.
Inspeccione las escobillas y anillos resbaladizos cada 500 horas y reemplace las escobillas cada 1500 horas.

227 727-B

MAINTENANCE DISPLAYS

- **ENGINE HOURS:** With engine off, place Engine Control switch in SPEED LOCK position.
- **OIL CHANGE INDICATOR:** With engine off, place Engine Control switch into the RUN/IDLE position to see hours before next oil change.
  Oil hours start at 100 and count down to 0 (oil change due).
  NOTE: Negative hours indicate when past recommended oil change interval.
  TO RESET: Cycle Engine Control switch from the RUN/IDLE to SPEED LOCK position 3 times.
- **LOW FUEL SHUTDOWN:** Engine will shut off prior to running out of fuel to prevent loss of fuel in the system. Display will read: noFUEL. Turn the machine off, add fuel, and restart.
- **HIGH COOLANT TEMPERATURE SHUTDOWN:** Engine will shut off and display will read: HI H20. See Owner's Manual for coolant information. Turn Engine Control switch OFF to reset shutdown.
- **LOW OIL PRESSURE SHUTDOWN:** Engine will shut off and display will read: LO OIL. Turn Engine Control switch OFF to reset shutdown.
- **ENGINE RPM's:** With engine running and the Process Selector switch in any Stick HOT position, cycle Engine Control switch from the RUN/IDLE to SPEED LOCK position 3 times and meters will display Engine RPM's. Use to check and set both idle and run speed RPM's. Accuracy is ±16 RPM's. Turn machine off to reset display.

PANTALLAS DE MANTENIMIENTO

- **HORAS DEL MOTOR:** Con el motor apagado, ponga el interruptor de control del motor en la posición "SPEED LOCK" (traba de velocidad).
- **INDICADOR DE CAMBIO DE ACEITE:** Con el motor apagado, ponga el interruptor de control del motor en la posición "RUN/IDLE" (marcha/ralentí) para ver las horas que faltan para el próximo cambio de aceite.
  Las horas del aceite comienzan a 100 y disminuyen a 0 (momento del cambio de aceite).
  NOTE: Horas negativas indican que el intervalo de cambio de aceite recomendado ha pasado.
  PARA REARMAR: Haga ciclos en el interruptor de control del motor desde la posición "RUN/IDLE" a "SPEED LOCK" 3 veces.
- **APAGAMIENTO POR RAZÓN DE COMBUSTIBLE BAJO:** El motor se apagará antes de quedarse sin combustible para prevenir que no haya combustible en el sistema. La pantalla indicará: noFUEL (no combustible). Apague el motor, añada combustible, y vuelva a arrancarlo.
- **APAGAMIENTO POR TEMPERATURA ALTA DEL REFRIGERANTE:** El motor se apagará y la pantalla indicará: HI H20. Vea el Manual del Dueño para la información sobre el líquido refrigerante. Use el interruptor de control del motor para APAGARLO (OFF) para rearmar el apagamiento.
- **APAGAMIENTO POR PRESIÓN BAJA DE ACEITE:** El motor se apagará y la pantalla indicará: LO OIL (aceite bajo). Use el interruptor de control del motor para APAGARLO (OFF) y rearmar el apagamiento.
- **RPM DEL MOTOR:** Con el motor funcionando y el interruptor de selección de proceso en cualquier posición "Stick HOT" (soldadura convencional CALIENTE), haga ciclo al interruptor de control del motor de la posición "RUN/IDLE a SPEED LOCK" 3 veces y los medidores mostrarán el RPM del motor. Use para verificar el RPM de ralentí y de marcha. La precisión es de ±16 RPM. Apague la máquina para rearmar la pantalla.

Belt . . . . . MILLER 187459
Kubota 15881-97011

Glow Plugs . . . MILLER 187820 Kubota 16851-65512
Do not use ether for starting.
Note: Operation not required when above 50° F (10° C) or when engine is warm. Never operate for more than 20 seconds continuous.

No use éter para arrancar.
Note: No se requiere esta operación cuando esté arriba de 50° F (10° C), o cuando el motor esté caliente. Nunca las opere por más de 20 seconds continuamente.

A complete Parts List is available at www.MillerWelds.com

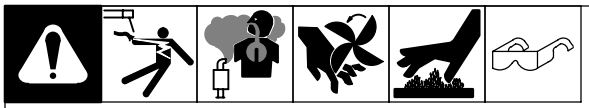
8-4. Adjusting Engine Speed

☞ *If the engine does not start and stop properly, verify the fuel solenoid is installed properly **before** adjusting engine speed (see Section A following).*

*If the engine does not stay at idle speed, verify the throttle solenoid is installed and adjusted properly **before** adjusting engine speed (see Section B following).*

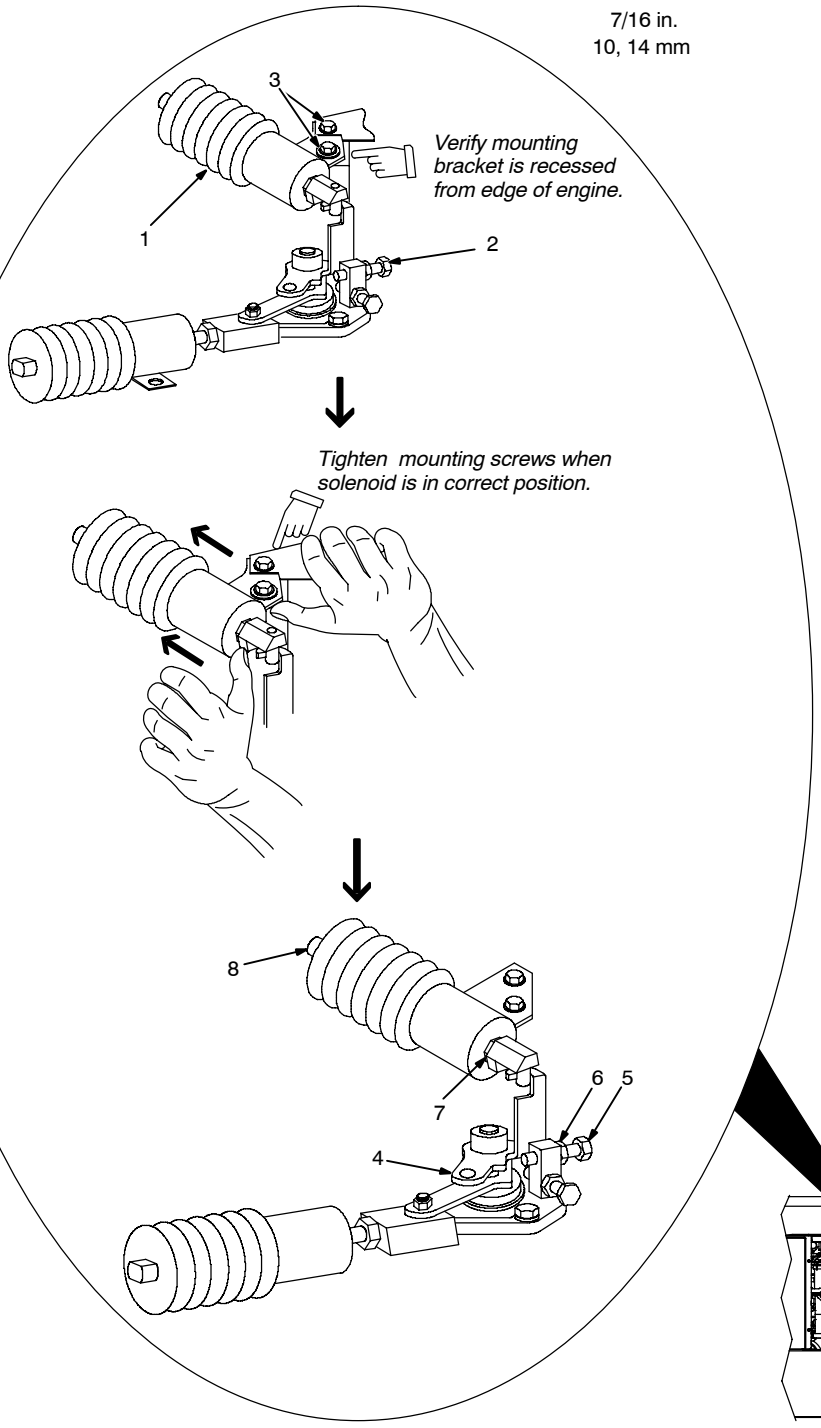
*If the engine runs properly but the speeds are incorrect, **do not** adjust the solenoids. Adjust the engine speed according to the instructions in Section C.*

A. Checking Fuel Solenoid



Tools Needed:

7/16 in.
10, 14 mm



Stop engine.

If the engine does not start and stop when using the Engine Control switch, check the position of the fuel solenoid.

Adjusting Fuel Solenoid Position

1 Fuel Solenoid
2 Stop Screw
3 Fuel Solenoid Mounting Screws

☞ *Stop screw is factory-set and should not be adjusted.*

When properly adjusted, the solenoid bracket is slightly recessed from the edge of the engine block and the solenoid linkage easily travels between the stop screw and the fuel solenoid internal stop.

If adjustment is necessary, loosen the solenoid mounting screws and push the solenoid bracket back toward engine as far as possible.

Continue pushing on solenoid bracket in a clockwise direction while tightening mounting screws.

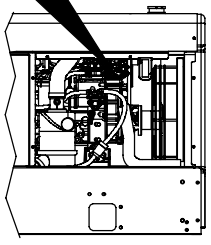
4 Shutdown Lever
5 Stop screw
6 Stop Screw Jam Nut
7 Fuel Solenoid Jam Nut
8 Plunger

☞ *Stop screw is factory-set and should not be adjusted.*

Hold throttle solenoid in idle (energized) position. If shutdown lever is touching or within 1/16 in. of stop screw, fuel solenoid is properly adjusted.

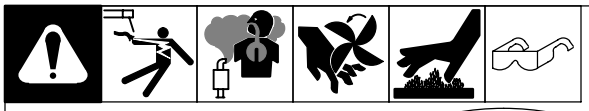
If lever is more than 1/16 in. from stop screw, check for clearance between jam nut and fuel solenoid. If there is clearance between jam nut and solenoid, loosen nut and turn plunger clockwise until lever touches stop screw. Retighten nut.

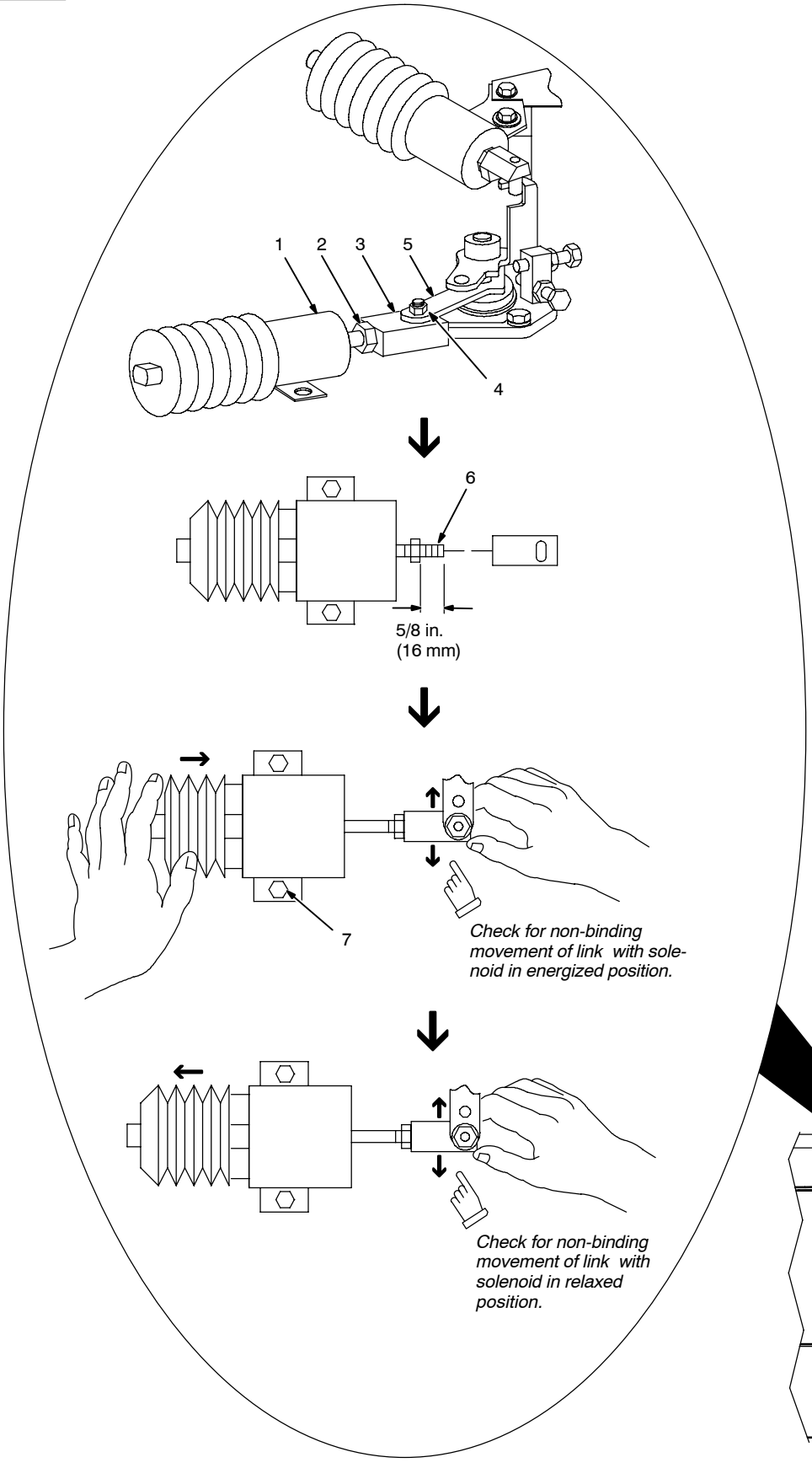
If there is no clearance between jam nut and solenoid, loosen the solenoid mounting screws and reposition the solenoid as described at the beginning of this section.



Ref. 804 197-A / 802 649

B. Checking Throttle Solenoid





Stop engine.

If the engine does not stay at idle speed, verify the the throttle solenoid and linkage is installed properly.

Adjusting Throttle Solenoid

1 Throttle Solenoid
2 Jam Nut
3 Solenoid Link
4 Shoulder Bolt
5 Throttle Lever
6 Solenoid Rod
7 Throttle Solenoid Mounting Screw

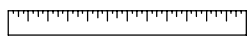
Loosen jam nut, remove shoulder bolt, and remove link from throttle lever. Install link 5/8 in. (16 mm) on solenoid rod. Reconnect link to shoulder bolt and throttle lever.

Push solenoid rod into idle (energized) position and check for non-binding lateral movement of throttle link at throttle lever. If link binds, loosen solenoid mounting screws. Move the solenoid slightly until the link moves freely with solenoid in **relaxed and energized** positions. Tighten screws.

Tighten jam nut.

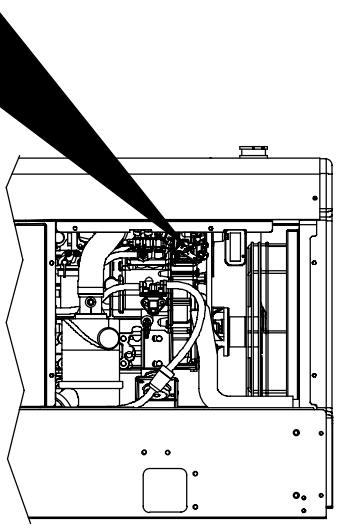
Go to Step C.

Tools Needed:



3/8, 7/16 in.

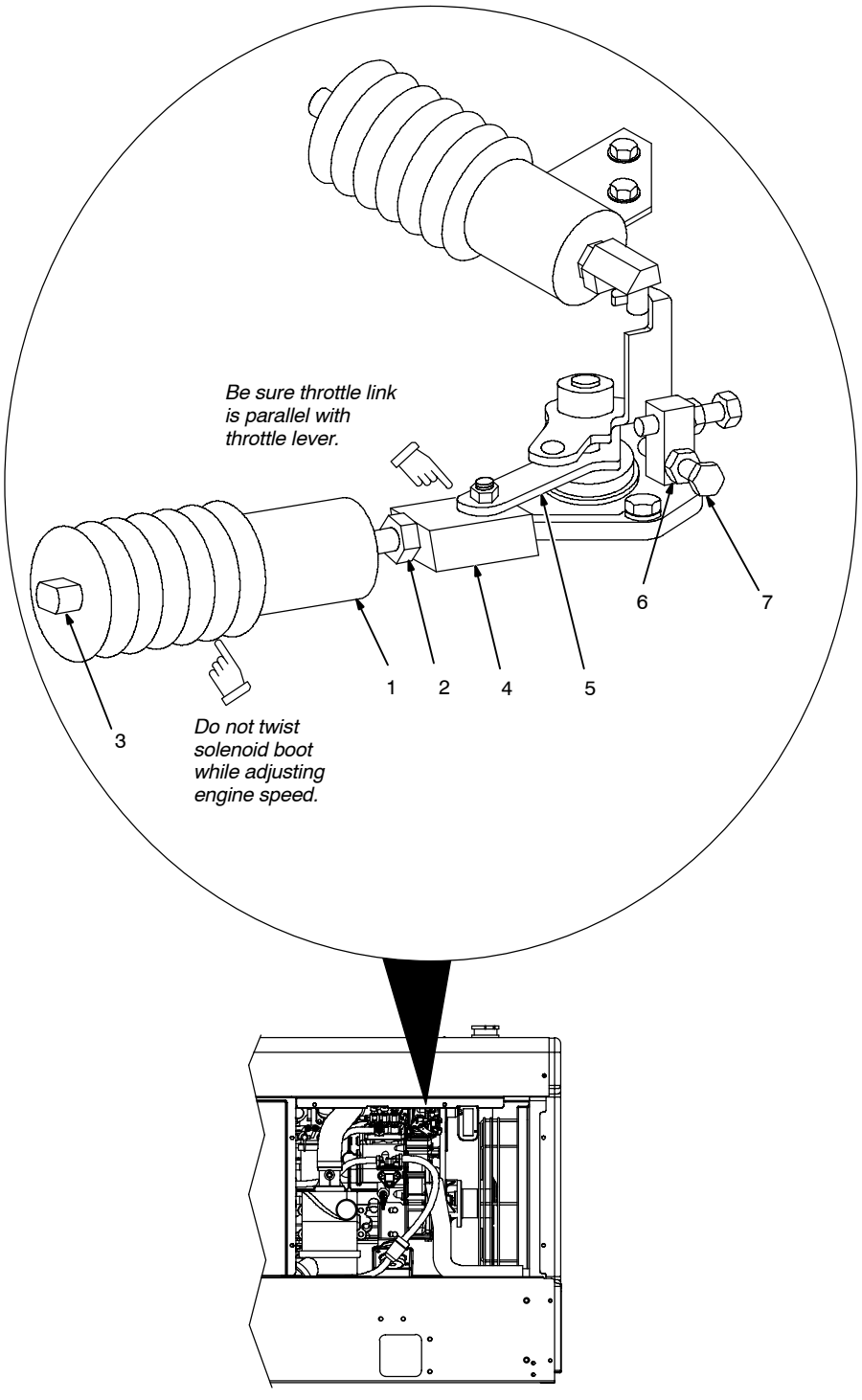
5/32 in.



Ref. 804 197-A / 802 649

C. Making Engine Speed Adjustments

Idle	2375–2450 rpm 39.6–40.8 Hz
Weld/Power	3675–3750 rpm 61.3–62.5 Hz



☞ *Before adjusting engine speed, verify throttle solenoid is installed properly (see Section B on previous page).*

Check engine speeds (see table) with a tachometer or use maintenance displays as follows: With engine running and the Process Selector switch in any Stick HOT position, cycle Engine Control switch from the Run/Idle to Speed Lock position 3 times and meters will display engine rpm's. Accuracy is ±16 rpm's.

If necessary, adjust speeds as follows:

Start engine and run until warm. Turn V/A control to max.

Adjusting Idle Speed

Turn Engine Control switch to Run/Idle position.

1 Throttle Solenoid
2 Idle Speed Jam Nut
3 Plunger
4 Throttle Link
5 Throttle Lever

Loosen jam nut. While holding throttle link with a 3/8 in. wrench, turn plunger clockwise to increase idle speed or counterclockwise to decrease idle speed.

☞ *After adjusting idle speed, verify the throttle link is parallel with the throttle lever. If necessary, loosen the idle speed jam nut and reposition the throttle link.*

☞ *Do not twist solenoid boot while adjusting engine speed.*

Tighten jam nut.

Adjusting Weld/Power Speed

Start engine and run until warm. Turn V/A control to max.

6 Weld Speed Jam Nut
7 Adjustment Screw

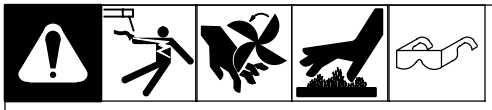
Turn Engine Control switch to Run position. Loosen nut and turn screw counterclockwise to increase speed. Turn screw clockwise to decrease speed. Tighten nut.

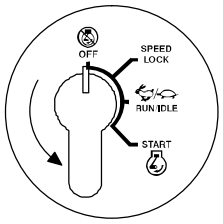
Tools Needed:

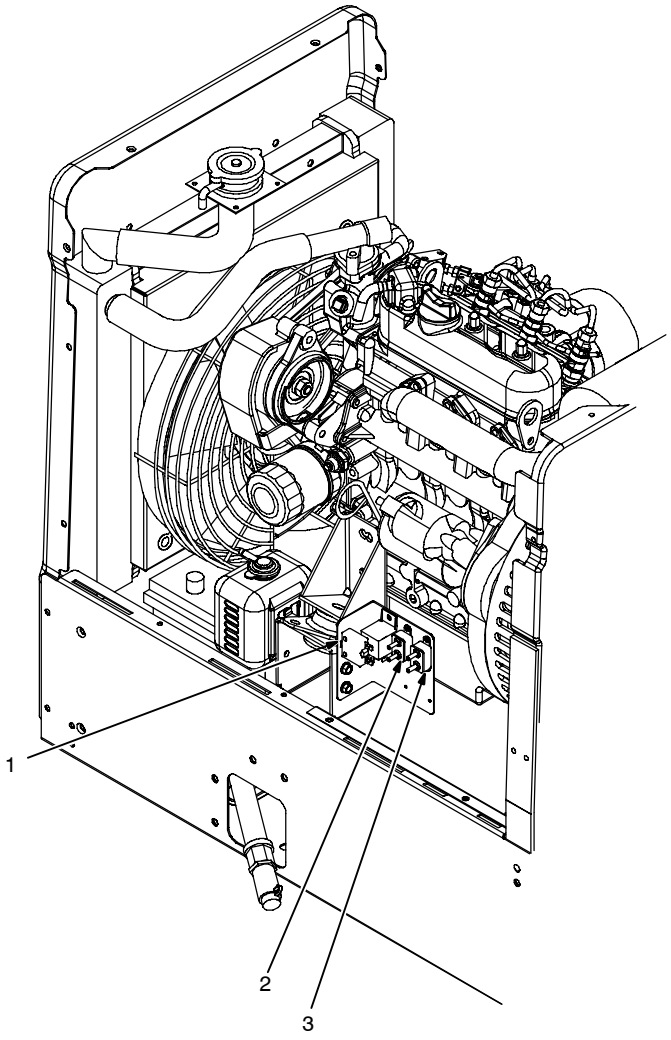
3/8, 7/16 in.
10, 14 mm

Ref. 804 197-A / 801 963

8-5. Overload Protection







Stop engine.

☞ *When a circuit protector opens, it usually indicates a more serious problem exists. Contact a Factory Authorized Service Agent.*

1 Supplementary Protector CB4

CB4 protects the stator winding supplying 24 volt ac output to Remote receptacle RC4. If CB4 opens, 24 volt ac output to RC4 stops.

☞ *Supplementary protectors CB1 and CB3 protect the stator winding supplying 115 volt ac output to Remote Receptacle RC4 (see Section 5-10).*

Press button to reset.

2 Circuit Breaker CB7

CB7 protects the engine glow plug circuit. If CB7 opens, the glow plug does not heat. CB7 automatically resets when the fault is corrected.

3 Circuit Breaker CB8

CB8 protects the engine battery circuit. If CB8 opens, the engine will not crank. CB8 automatically resets when the fault is corrected.

Ref. 804 198-D

8-6. Troubleshooting Tables

A. Welding

Trouble	Remedy
No weld output.	Check weld control settings.
	Check weld connections.
	Disconnect equipment from generator power receptacles during start-up.
	Increase front panel and/or remote voltage/amperage control settings (see Sections 6-2 and 6-6).
	Check and secure connections to Remote receptacle RC4 (see Sections 5-10).
	Have Factory Authorized Service Agent check brushes, slip rings, and circuit boards PC1 and PC2.
Low weld output.	Check control settings.
	Increase front panel and/or remote voltage/amperage control settings (see Sections 6-2 and 6-6).
	Check and clean air cleaner as necessary (see Section 8-2).
	Clean and/or replace fuel filter and inline fuel strainer as necessary (see Section 8-3)
	Check engine speed, and adjust if necessary (see Section 8-4).
	See engine manual.
	Have Factory Authorized Service Agent check brushes, slip rings, and circuit boards PC1 and PC2.
High weld output.	Check control settings.
	Check and adjust engine speed (see Section 8-4).
	Check for obstructed movement of solenoid linkage (see Section 8-4).
	Have Factory Authorized Service Agent check circuit boards PC1 and PC2.
Weld output cannot be adjusted.	Have Factory Authorized Service Agent check field current control board PC2.
Erratic weld output.	Check control settings.
	Clean and tighten connections both inside and outside unit.
	Check and secure lead connections to remote control.
	Be sure connection to work piece is clean and tight.
	Remove excessive coils from weld cables.
	Use dry, properly stored electrodes.
	Check and adjust engine speed (see Section 8-4).
	Check shielding gas, ensure proper shielding gas coverage while welding.
	Have Factory Authorized Service Agent check brushes, slip rings, and circuit boards PC1 and PC2.
No remote voltage/amperage control.	Check and tighten connections to Remote receptacle RC4 (see Section 5-10). Check and secure lead connections to remote control.
No front panel voltage/amperage control.	Disconnect remote control from Remote receptacle RC4 if not needed for weld process (see Section 5-10).
No 24 volt ac power output at Remote receptacle RC4.	Reset supplementary protector CB4 (see Section 8-5).
No 115 volt ac power output at Remote receptacle RC4.	Reset supplementary protector(s) CB1 and/or CB3 (see Section 7-1).

Trouble	Remedy
Lack of high frequency; difficulty in establishing Gas Tungsten Arc Welding arc.	Use proper size tungsten for welding amperage.
	Reduce leakage of high frequency from torch or work cable (check grounding, remove excessive coils from weld cables, use shorter weld cables, etc.).
	Check cables and torch for cracked or deteriorated insulation or bad connections. Repair or replace necessary parts.
Wandering arc – poor control of arc direction.	Reduce gas flow rate.
	Select proper size tungsten. Properly prepare tungsten.
Tungsten electrode oxidizing and not remaining bright after conclusion of weld.	Shield weld zone from drafts.
	Increase postflow time.
	Check and tighten all gas fittings.
	Properly prepare tungsten.

B. Generator

Trouble	Remedy
No power output.	Reset supplementary protectors CB1, CB2 and/or CB3 (see Section 7-1).
	Have Factory Authorized Service Agent check brushes, slip rings, and circuit boards PC1 and PC2.
Low power output.	Check and clean air cleaner as necessary.
	Clean and/or replace fuel filter and inline fuel strainer as necessary (see Section 8-3)
	Check engine speed, and adjust if necessary (see Section 8-4).
	See engine manual.
High power output.	Check engine speed, and adjust if necessary (see Section 8-4).
Erratic power output.	Check receptacle wiring and connections.
	Check governor according to engine manual.
	Have Factory Authorized Service Agent check brushes, slip rings, and field current control board PC2.

C. Engine

Trouble	Remedy
Engine does not crank.	Supplementary protector CB8 may be open (see Section 8-5). Wait and retry.
	Check battery voltage.
	Check battery connections and tighten if necessary.
	Check plug Engine Control switch and engine wiring harness connections.
	Have Factory Authorized Service Agent check Engine Control switch S2 or circuit breaker CB8.
Engine cranks but does not start.	Check fuel level (see Section 6-1).
	Open fuel valve (see Section 5-6).
	Service inline fuel strainer and fuel filter (see Section 8-3).
	Check battery and replace if necessary.
	Check engine charging system according to engine manual.
	Bleed air from fuel system according to engine manual.
	Check fuel solenoid according to engine manual.
	Have Factory Authorized Service Agent check glow Plug switch S6, glow plug, and control relay CR3.

Trouble	Remedy
Engine starts but stops when Engine Control switch S2 returns to Run/Idle position.	Check oil level (see Section 5-6). Engine will not start if oil pressure is too low.
	Check coolant level and fan belt (see Section 5-6 and engine manual). Engine will not start if engine temperature is too high.
	Check and refill crankcase with proper viscosity oil for operating temperature, if necessary (see Section 5-6).
	Have Factory Authorized Service Agent check low oil pressure shutdown switch S5 and engine temperature switch S4.
Engine does not stop.	Stop engine by closing fuel valve (see Section 5-6). Adjust shutdown solenoid (see Section 8-4).
Engine stopped during normal operation.	Check fuel level (see Section 6-1).
	Open fuel valve (see Section 5-6).
	Check oil level (see Section 5-6). Engine stops if oil pressure is too low.
	Check coolant level and fan belt (see Section 5-6 and engine manual). Engine stops if engine temperature is too high.
	Have Factory Authorized Service Agent check low oil pressure shutdown switch S5 and engine temperature switch S4.
Battery discharges between uses.	Clean top of battery with baking soda and water solution; rinse with clear water.
	Periodically recharge battery (approximately every 3 months).
	Replace battery.
	Check voltage regulator according to engine manual.
Engine does not return to idle speed when load is removed with Engine Control switch in Run/Idle position.	Remove all weld and generator power loads.
	Check for obstructed movement of solenoid linkage (see Section 8-4).
	Have Factory Authorized Service Agent check current transformer CT1, idle lock switch S7, throttle solenoid TS1, and Engine Control switch S2.
Engine does not remain at weld/power speed when power or weld load is applied with Engine Control switch in Run/Idle position.	Check for obstructed movement of solenoid linkage (see Section 8-4).
	Have Factory Authorized Service Agent check control relay CR2, control relay CR4, current transformer CT1, and throttle solenoid TS1.
Engine does not remain at idle speed with Engine Control switch in Speed Lock position and Idle Lock switch in Idle position.	Check for obstructed movement of solenoid linkage (see Section 8-4).
	Have Factory Authorized Service Agent check control relay CR2, control relay CR4, Idle Lock switch S7, and throttle solenoid TS1.
Engine uses oil during run-in period; wetstacking occurs.	Dry engine (see Section 11).

SECTION 9 – PARTS LIST

9-1. Recommended Spare Parts

Dia. Mkgs.	Part No.	Description	Quantity
		Recommended Spare Parts	
	187441	Element, Air Cleaner	1
	♦202102	Element, Air Cleaner Safety	1
	213858	Filter, Fuel In–line 5/16x5/16 Mic 125 –175	1
	187442	Element, Fuel Filter	1
	187443	Oil Filter	1
	187459	Belt, Fan	1
GLOW PLUG	187820	Glow Plug	1
	187819	Injector Assy,	1
	206421	Filter Kit, Kubota 722 (Includes air cleaner element, fuel, oil filters)	1

♦ Optional

☞ *A complete Parts List is available on-line at www.MillerWelds.com*

Notes

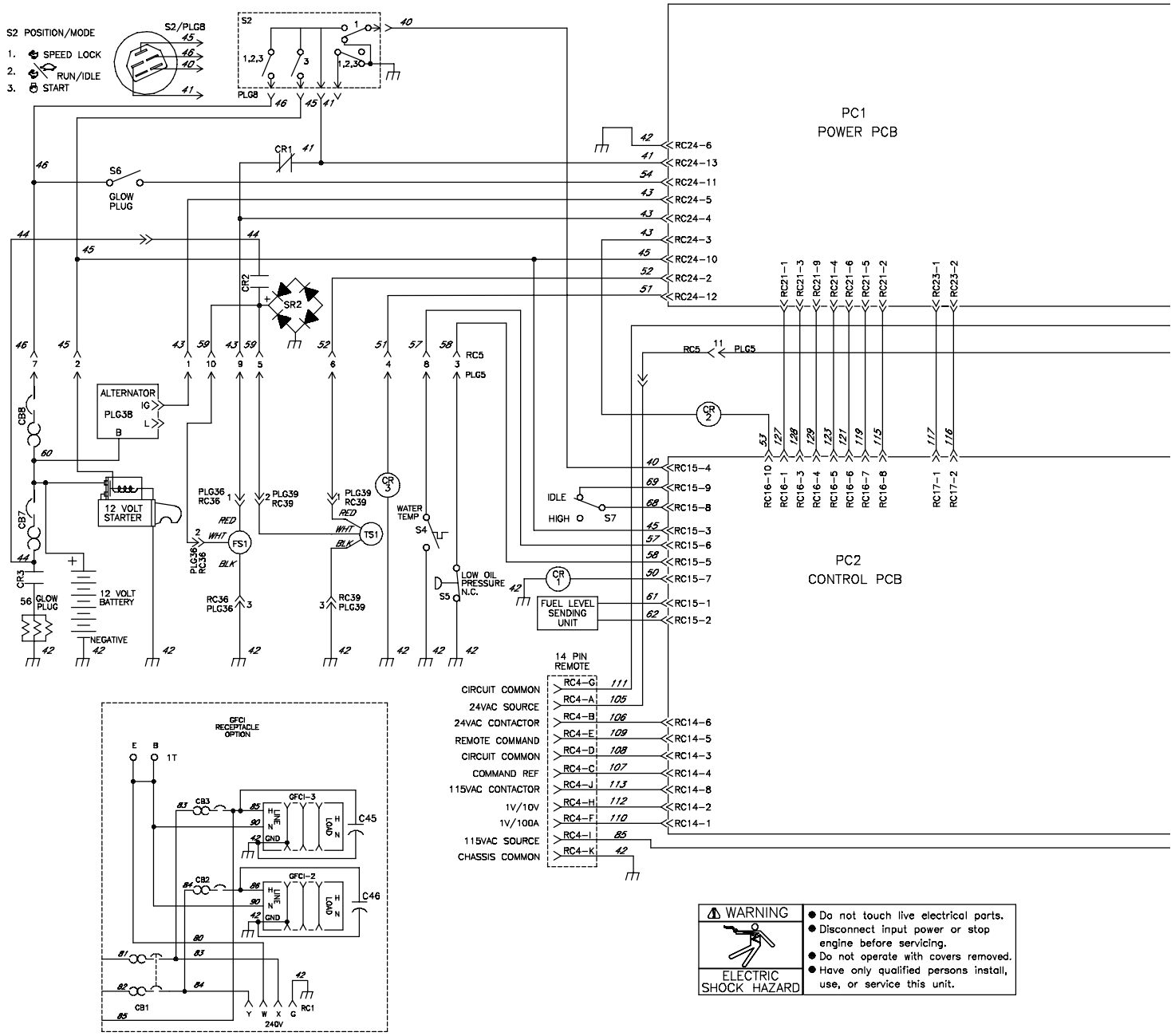
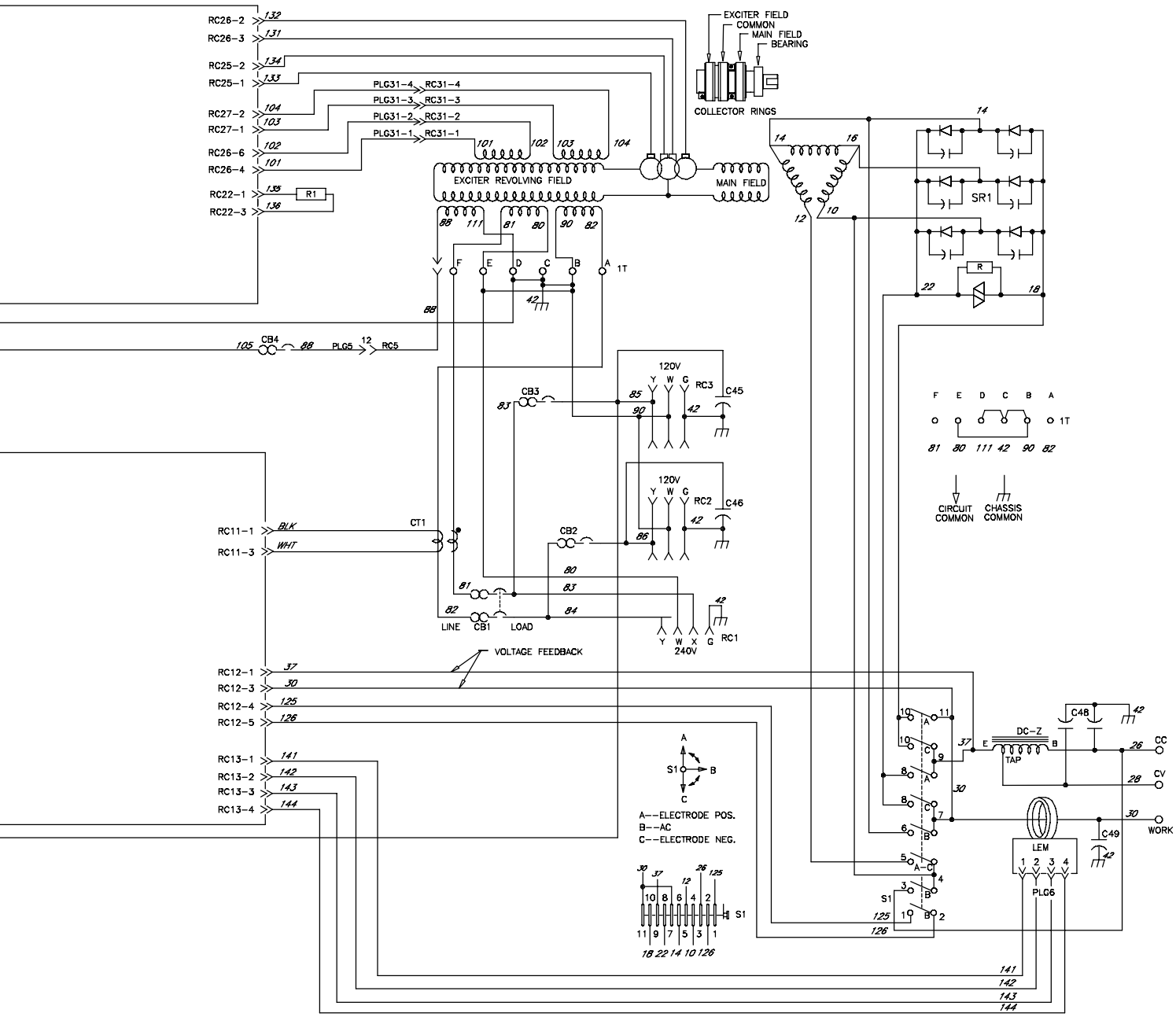
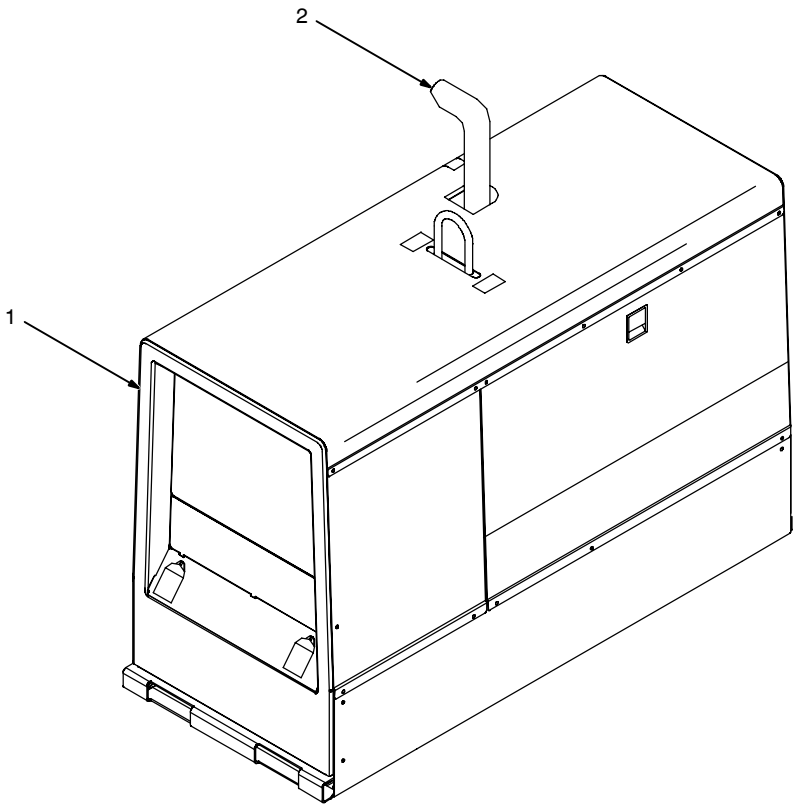


Figure 10-1. Circuit Diagram For Welding Generator


EXCITER FIELD
COMMON
MAIN FIELD
BEARING
COLLECTOR RINGS
EXCITER REVOLVING FIELD
MAIN FIELD
SR1
R
R1
RC26-2
RC26-3
RC25-2
RC25-1
RC27-2
RC27-1
RC26-6
RC26-4
RC22-1
RC22-3
PLG31-4
RC31-4
PLG31-3
RC31-3
PLG31-2
RC31-2
PLG31-1
RC31-1
F E D C B A 1T
CB4
PLG5
RC5
CB3
RC3
C45
CB2
RC2
C46
CT1
RC11-1
RC11-3
BLK
WHT
CB1
LINE
LOAD
RC1
120V
240V
VOLTAGE FEEDBACK
CIRCUIT COMMON
CHASSIS COMMON
RC12-1
RC12-3
RC12-4
RC12-5
RC13-1
RC13-2
RC13-3
RC13-4
S1
A--ELECTRODE POS.
B--AC
C--ELECTRODE NEG.
DC-Z
TAP
C48
C49
LEM
PLG6
CC
CV
WORK

23247 676-A

11-1. Run-In And Wetstacking



1 Welding Generator

Run-in procedures for this engine should not be required. Put unit into regular service.

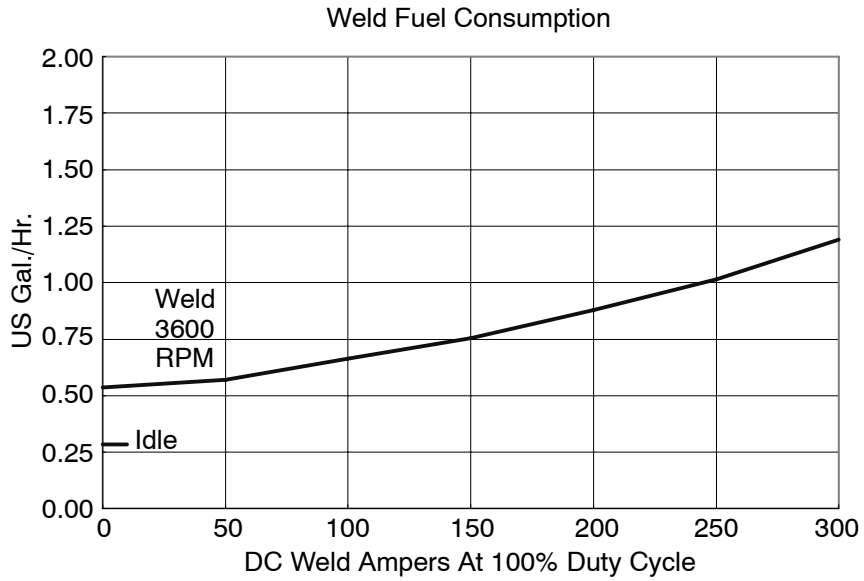
2 Engine Exhaust Pipe

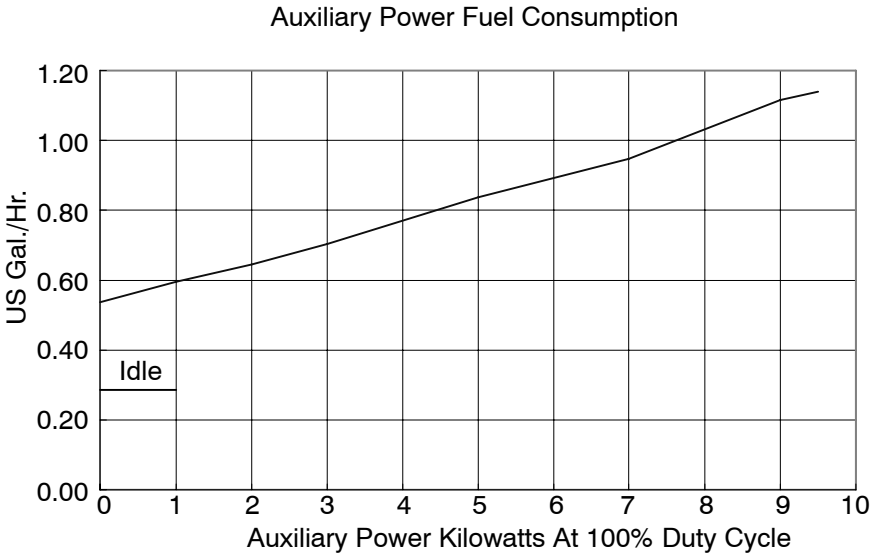
Wetstacking is unburned fuel and oil in the exhaust pipe and occurs if the engine is run too long at light load or idle rpm.

If exhaust pipe is coated with a wet, black, tar-like substance, contact factory service for procedures to properly dry engine and seat piston rings.

SECTION 12 – PERFORMANCE DATA

12-1. Fuel Consumption Curves





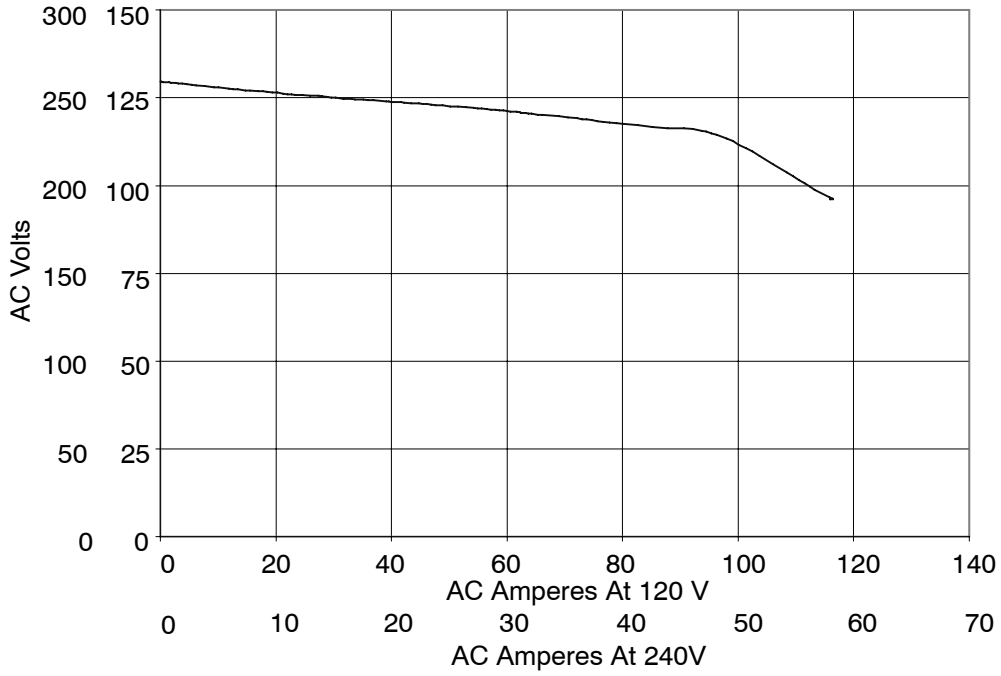
On a typical job using 1/8 in 7018 electrodes (125 amps, 20% duty cycle), expect about 24 hours of operation.

Welding at 150 amps at 40% duty cycle uses approximately 1/2 gallon per hour, or about 22 hours of operation.

207 922-A / 207 923-A

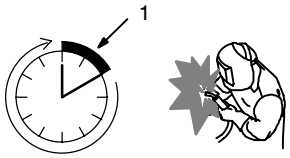
12-2. Generator Power Curve

The ac generator power curve shows the generator power available in amperes at the receptacles.



226 760-A

12-3. Duty Cycle

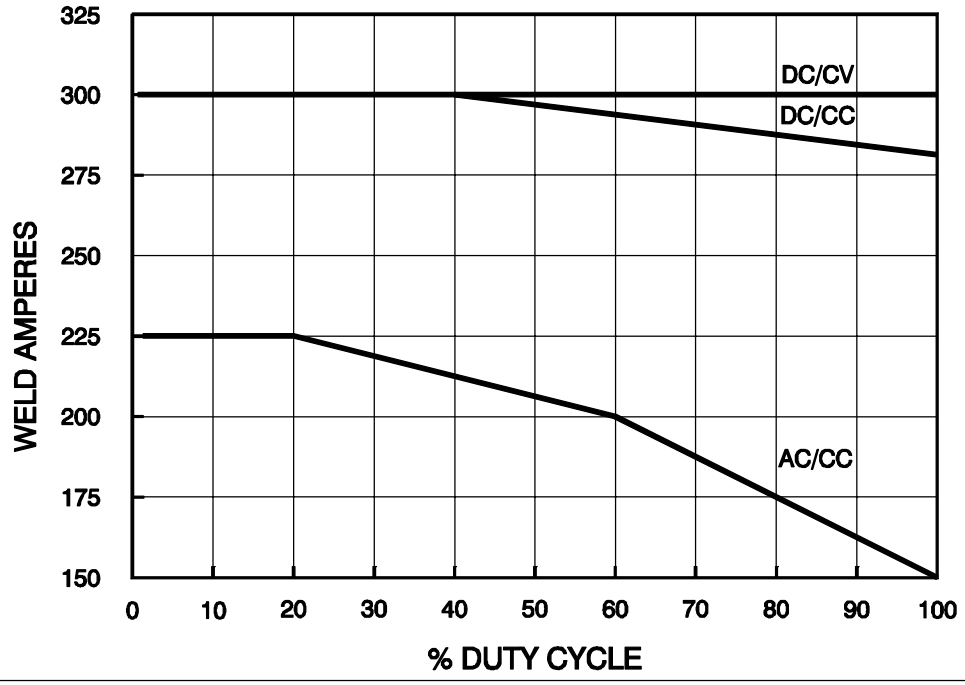


1 100% Duty Cycle

Duty cycle is the percentage of 10 minutes that unit can weld at rated load without overheating.

☞ *This unit is rated at 280 amperes DC for continuous welding.*

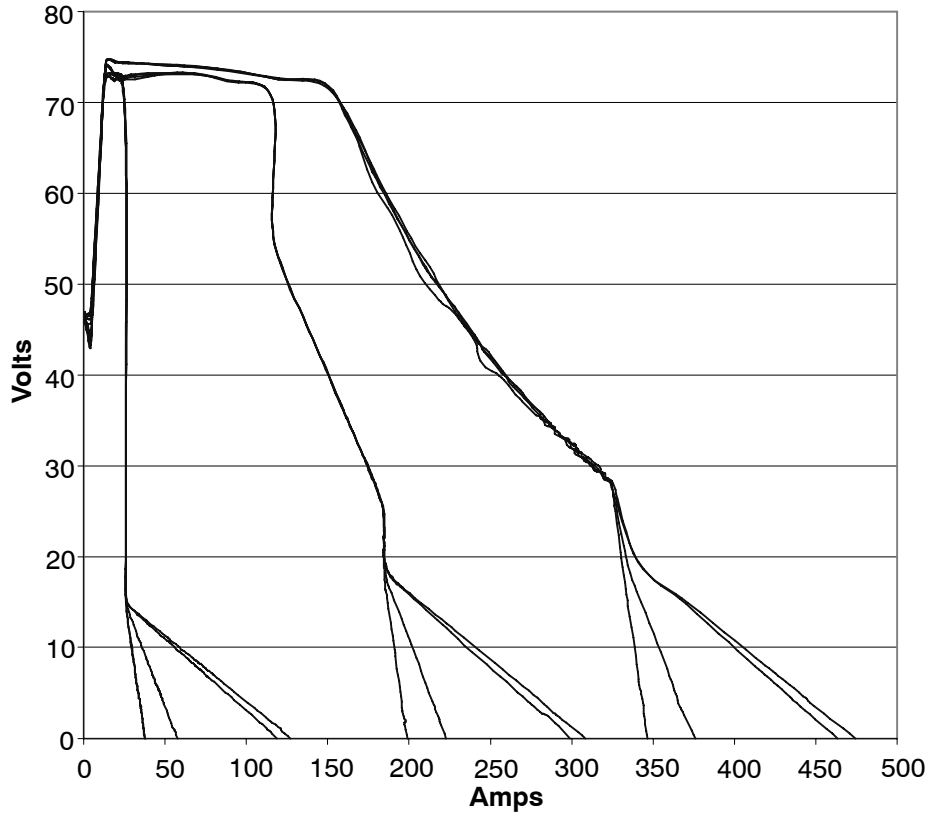
NOTICE – *Exceeding duty cycle can damage unit and void warranty.*



207 925

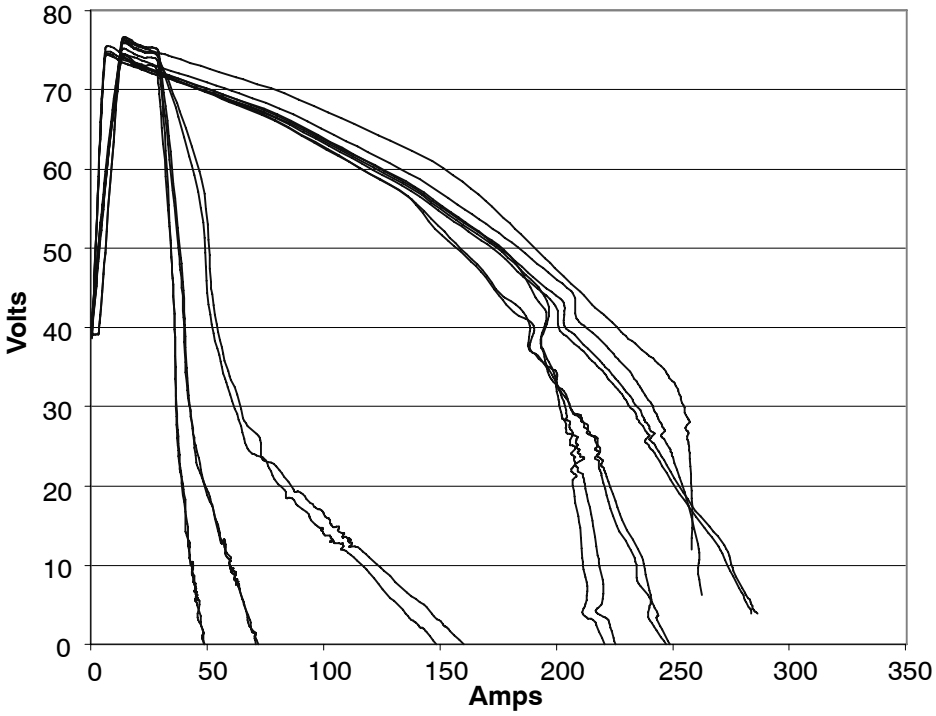
12-4. Stick Mode Volt-Ampere Curves

A. CC/DC Stick Mode



The volt-ampere curves show the minimum and maximum voltage and amperage output capabilities of the welding generator. Curves of other settings fall between the curves shown.

C. CC/AC STICK Mode

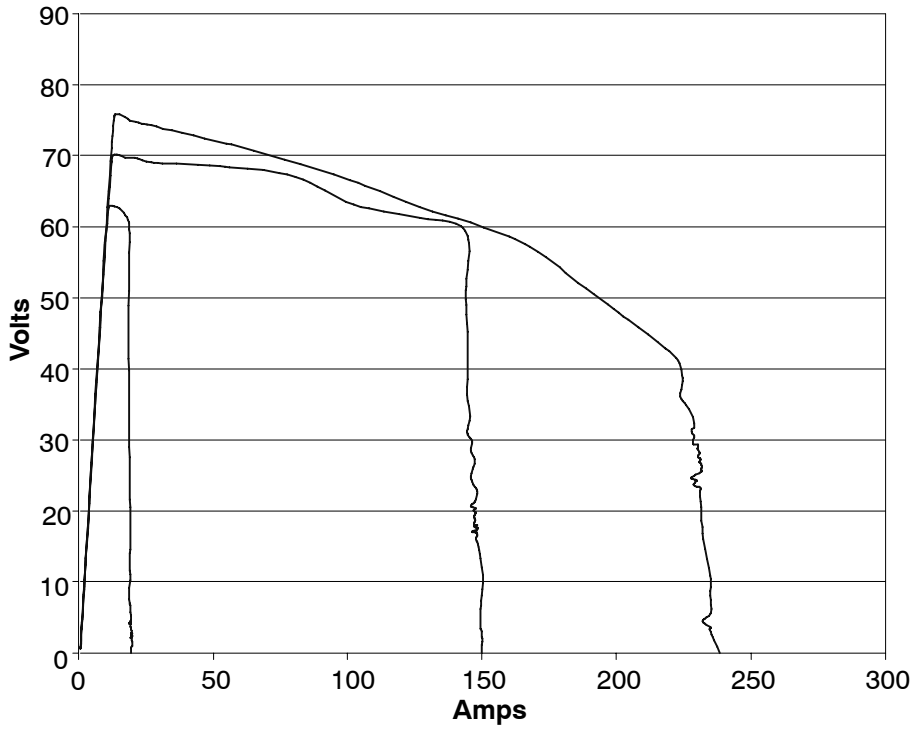


226 756-A / 223 761-A

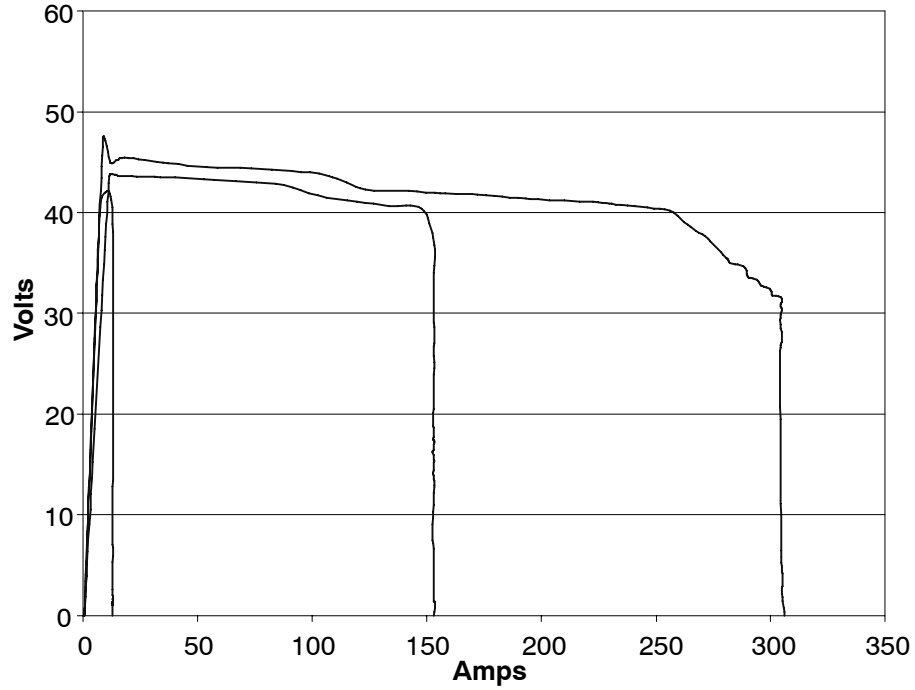
12-5. TIG Mode Volt-Ampere Curves

The volt-ampere curves show the minimum and maximum voltage and amperage output capabilities of the welding generator. Curves of other settings fall between the curves shown.

A. CC/AC TIG Mode

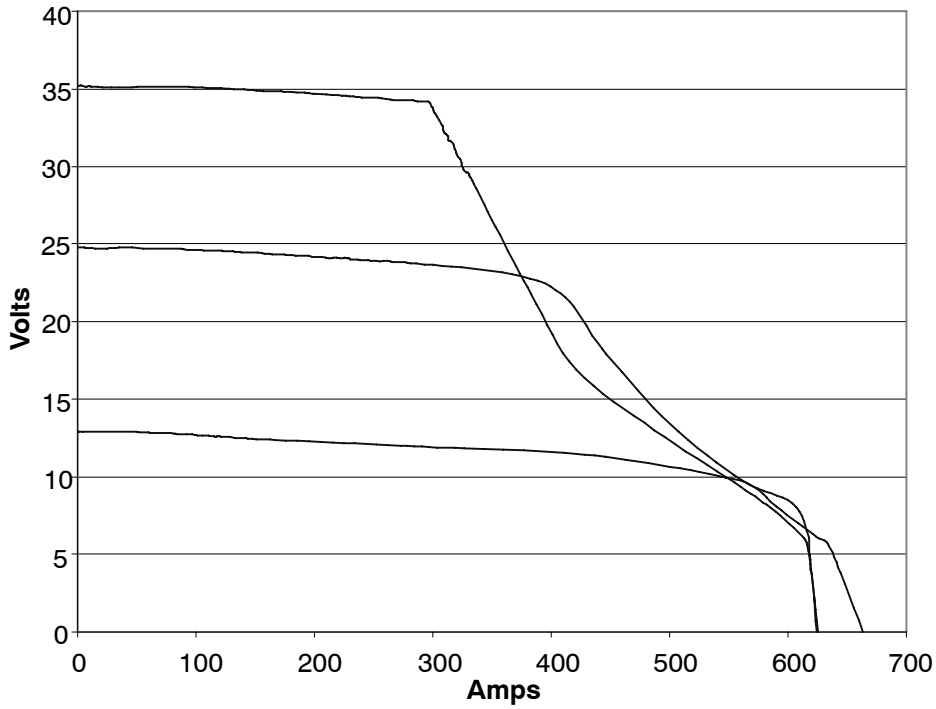


B. CC/DC TIG Mode



226 758-A / 226 759-A

12-6. MIG Mode Volt-Ampere Curve



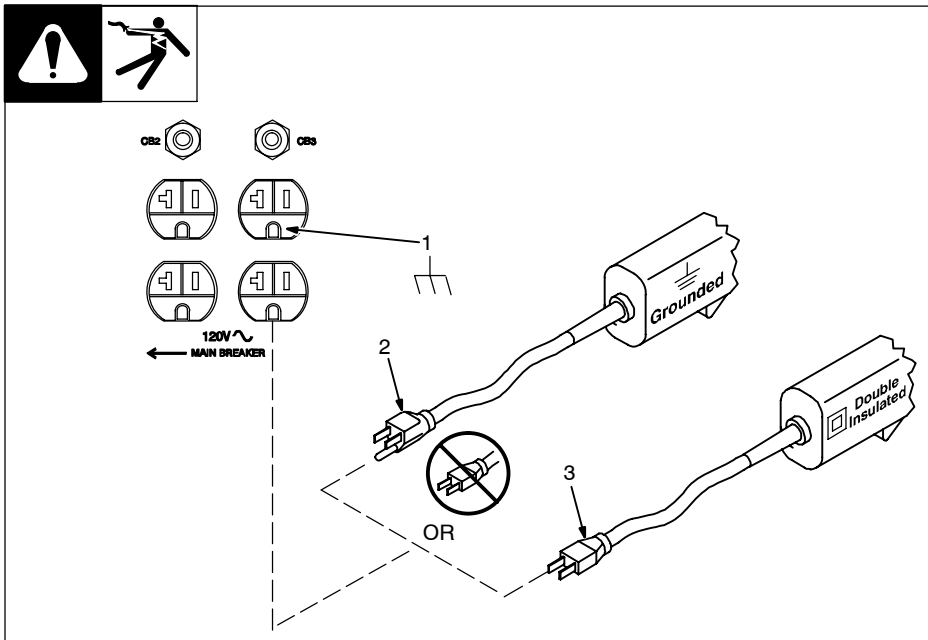
The volt-ampere curves show the minimum and maximum voltage and amperage output capabilities of the welding generator. Curves of other settings fall between the curves shown.

226 757-A

SECTION 13 – GENERATOR POWER GUIDELINES

☞ *The views in this section are intended to be representative of all engine-driven welding generators. Your unit may differ from those shown.*

13-1. Selecting Equipment



1 Generator Power Receptacles – Neutral Bonded To Frame

2 3-Prong Plug From Case Grounded Equipment

3 2-Prong Plug From Double Insulated Equipment

☞ *Be sure equipment has double insulated symbol and/or wording on it.*

⚠ **Do not use 2-prong plug unless equipment is double insulated.**

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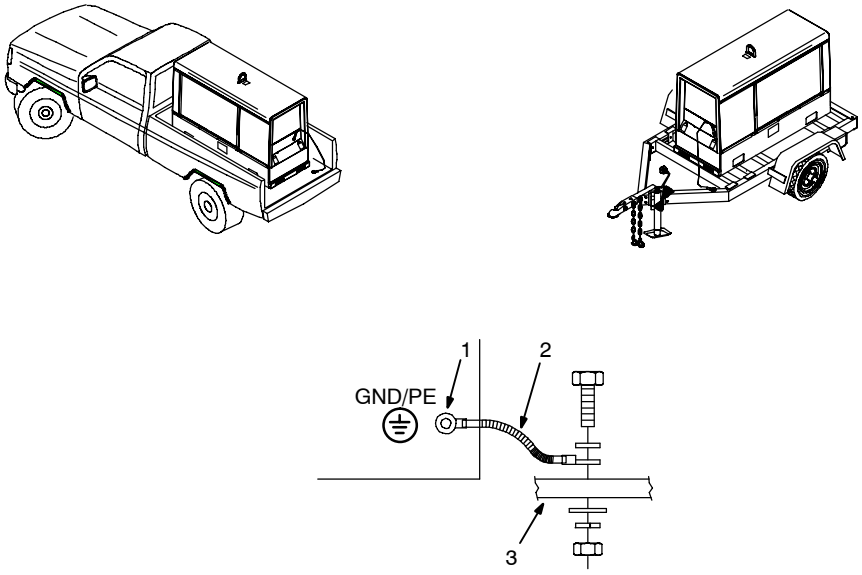
13-2. Grounding Generator To Truck Or Trailer Frame



⚠ **Always ground generator frame to vehicle frame to prevent electric shock and static electricity hazards.**

⚠ **Also see AWS Safety & Health Fact Sheet No. 29, Grounding of Portable And Vehicle Mounted Welding Generators.**

1 Equipment Grounding Terminal (On Front Panel)

2 Grounding Cable (Not Supplied)

3 Metal Vehicle Frame

Connect cable from equipment ground terminal to metal vehicle frame. Use #8 AWG or larger insulated copper wire.

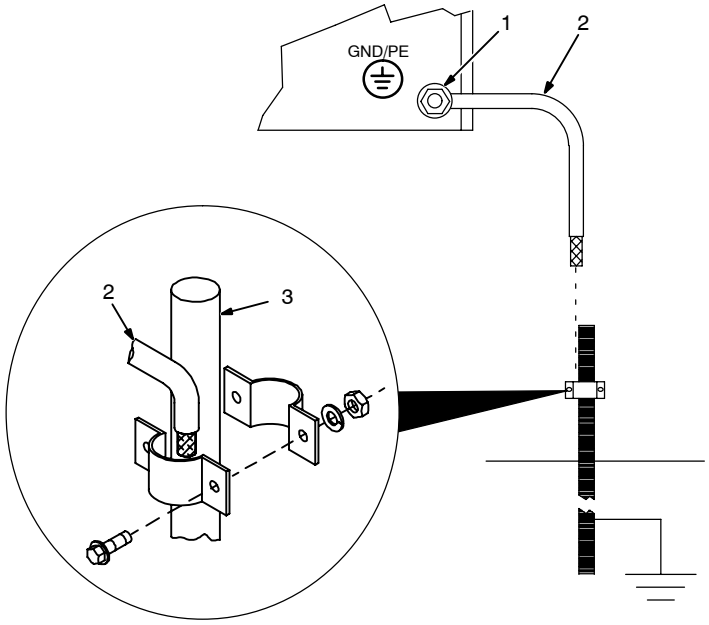
☞ *Electrically bond generator frame to vehicle frame by metal-to-metal contact.*

⚠ **Bed liners, shipping skids, and some running gear insulate the welding generator from the vehicle frame. Always connect a ground wire from the generator equipment grounding terminal to bare metal on the vehicle frame as shown.**

⚠ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

800 652-D

13-3. Grounding When Supplying Building Systems



1 Equipment Grounding Terminal

2 Grounding Cable

Use #8 AWG or larger insulated copper wire.

3 Ground Device

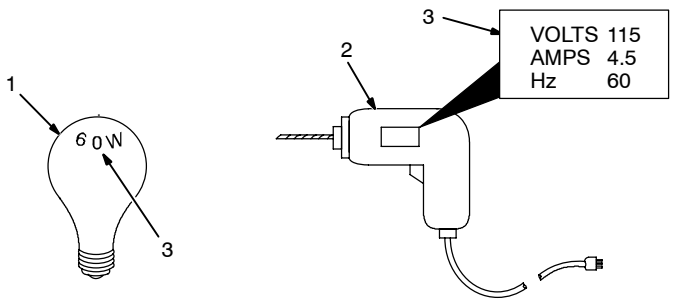
☞ *Use ground device as stated in electrical codes.*

Ground generator to system earth ground if supplying power to a premises (home, shop, farm) wiring system.

Also see AWS Safety & Health Fact Sheet No. 29, Grounding of Portable And Vehicle Mounted Welding Generators.

ST-800 576-B

13-4. How Much Power Does Equipment Require?



1 Resistive Load

A light bulb is a resistive load and requires a constant amount of power.

2 Non-Resistive Load

Equipment with a motor is a non-resistive load and requires approximately six times more power while starting the motor than when running (see Section 13-8).

3 Rating Data

Rating shows volts and amperes, or watts required to run equipment.

Amperes x Volts = Watts

Example 1: If a drill uses 4.5 amperes at 115 volts, calculate its running power requirement in watts.

4.5 A x 115 V = 520 W

The load applied by the drill is 520 watts.

Example 2: If three 200 watt flood lamps are used with the drill from Example 1, add the individual loads to calculate total load.

(3 x 200W) + 520 W = 1120 W

The total load applied by the three flood lamps and drill is 1120 watts.

S-0623

13-5. Approximate Power Requirements For Industrial Motors

Industrial Motors	Rating	Starting Watts	Running Watts
Split Phase	1/8 HP	800	300
	1/6 HP	1225	500
	1/4 HP	1600	600
	1/3 HP	2100	700
	1/2 HP	3175	875
Capacitor Start-Induction Run	1/3 HP	2020	720
	1/2 HP	3075	975
	3/4 HP	4500	1400
	1 HP	6100	1600
	1-1/2 HP	8200	2200
	2 HP	10550	2850
	3 HP	15900	3900
	5 HP	23300	6800
Capacitor Start-Capacitor Run	1-1/2 HP	8100	2000
	5 HP	23300	6000
	7-1/2 HP	35000	8000
	10 HP	46700	10700
Fan Duty	1/8 HP	1000	400
	1/6 HP	1400	550
	1/4 HP	1850	650
	1/3 HP	2400	800
	1/2 HP	3500	1100

13-6. Approximate Power Requirements For Farm/Home Equipment

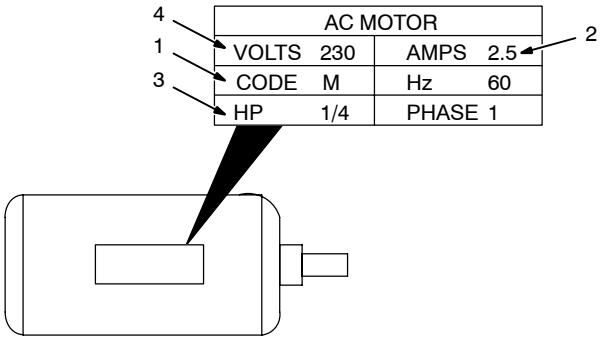
Farm/Home Equipment	Rating	Starting Watts	Running Watts
Stock Tank De-Icer		1000	1000
Grain Cleaner	1/4 HP	1650	650
Portable Conveyor	1/2 HP	3400	1000
Grain Elevator	3/4 HP	4400	1400
Milk Cooler		2900	1100
Milker (Vacuum Pump)	2 HP	10500	2800
FARM DUTY MOTORS	1/3 HP	1720	720
Std. (e.g. Conveyors,	1/2 HP	2575	975
Feed Augers, Air	3/4 HP	4500	1400
Compressors)	1 HP	6100	1600
	1-1/2 HP	8200	2200
	2 HP	10550	2850
	3 HP	15900	3900
	5 HP	23300	6800
High Torque (e.g. Barn	1-1/2 HP	8100	2000
Cleaners, Silo Unloaders,	5 HP	23300	6000
Silo Hoists, Bunk Feeders)	7-1/2 HP	35000	8000
	10 HP	46700	10700
3-1/2 cu. ft. Mixer	1/2 HP	3300	1000
High Pressure 1.8 Gal/Min	500 PSI	3150	950
Washer 2 gal/min	550 PSI	4500	1400
2 gal/min	700 PSI	6100	1600
Refrigerator or Freezer		3100	800
Shallow Well Pump	1/3 HP	2150	750
	1/2 HP	3100	1000
Sump Pump	1/3 HP	2100	800
	1/2 HP	3200	1050

13-7. Approximate Power Requirements For Contractor Equipment

Contractor	Rating	Starting Watts	Running Watts
Hand Drill	1/4 in	350	350
	3/8 in	400	400
	1/2 in	600	600
Circular Saw	6-1/2 in	500	500
	7-1/4 in	900	900
	8-1/4 in	1400	1400
Table Saw	9 in	4500	1500
	10 in	6300	1800
Band Saw	14 in	2500	1100
Bench Grinder	6 in	1720	720
	8 in	3900	1400
	10 in	5200	1600
Air Compressor	1/2 HP	3000	1000
	1 HP	6000	1500
	1-1/2 HP	8200	2200
	2 HP	10500	2800
Electric Chain Saw	1-1/2 HP, 12 in	1100	1100
	2 HP, 14 in	1100	1100
Electric Trimmer	Standard 9 in	350	350
	Heavy Duty 12 in	500	500
Electric Cultivator	1/3 HP	2100	700
Elec. Hedge Trimmer	18 in	400	400
Flood Lights	HID	125	100
	Metal Halide	313	250
	Mercury	1000	
	Sodium	1400	
	Vapor	1250	1000
Submersible Pump	400 gph	600	200
Centrifugal Pump	900 gph	900	500
Floor Polisher	3/4 HP, 16 in	4500	1400
	1 HP, 20 in	6100	1600
High Pressure Washer	1/2 HP	3150	950
	3/4 HP	4500	1400
	1 HP	6100	1600
55 gal Drum Mixer	1/4 HP	1900	700
Wet & Dry Vac	1.7 HP	900	900
	2-1/2 HP	1300	1300

13-8. Power Required To Start Motor

Single-Phase Induction Motor Starting Requirements								
Motor Start Code	G	H	J	K	L	M	N	P
KVA/HP	6.3	7.1	8.0	9.0	10.0	11.2	12.5	14.0



1 Motor Start Code

2 Running Amperage

3 Motor HP

4 Motor Voltage

To find starting amperage:

Step 1: Find code and use table to find kVA/HP. If code is not listed, multiply running amperage by six to find starting amperage.

Step 2: Find Motor HP and Volts.

Step 3: Determine starting amperage (see example).

Welding generator amperage output must be at least twice the motor's running amperage.

(kVA/HP x HP x 1000) / Volts = Starting Amperage

Example: Calculate starting amperage required for a 230 V, 1/4 HP motor with a motor start code of M.

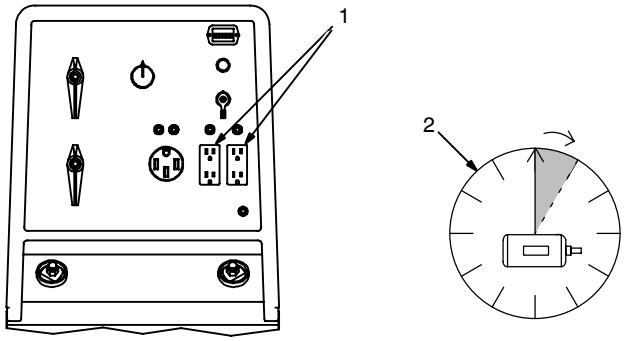
Volts = 230, HP = 1/4, kVA/HP = 11.2

(11.2 x 1/4 x 1000) / 230 = 12.2A

Starting the motor requires 12.2 amperes.

S-0624

13-9. How Much Power Can Generator Supply?



1 Limit Load To 90% Of Generator Output

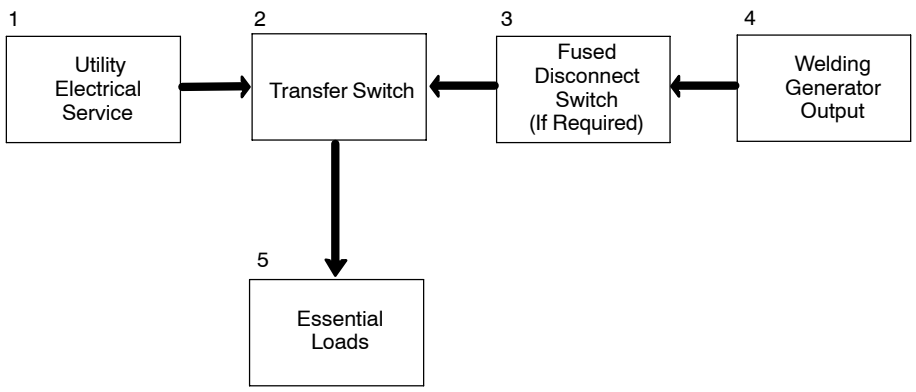
Always start non-resistive (motor) loads in order from largest to smallest, and add resistive loads last.

2 5 Second Rule

If motor does not start within 5 seconds, turn off power to prevent motor damage. Motor requires more power than generator can supply.

Ref. ST-800 396-A / S-0625

13-10. Typical Connections To Supply Standby Power



⚠ **Have only qualified persons perform these connections according to all applicable codes and safety practices.**

⚠ **Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.**

☞ *Customer-supplied equipment is required if generator will supply standby power during emergencies or power outages.*

1 Utility Electrical Service

2 Transfer Switch (Double-Throw)

Switch transfers the electrical load from electric utility service to the generator. Transfer load back to electric utility when service is restored.

Install correct switch (customer-supplied). Switch rating must be same as or greater than the branch overcurrent protection.

3 Fused Disconnect Switch

Install correct switch (customer-supplied) if required by electrical code.

4 Welding Generator Output

Generator output voltage and wiring must be consistent with regular (utility) system voltage and wiring.

Connect generator with temporary or permanent wiring suitable for the installation.

Turn off or unplug all equipment connected to generator before starting or stopping engine. When starting or stopping, the engine has low speed which causes low voltage and frequency.

5 Essential Loads

Generator output may not meet the electrical requirements of the premises. If generator does not produce enough output to meet all requirements, connect only essential loads (pumps, freezers, heaters, etc. – See Section 13-4).

13-11. Selecting Extension Cord (Use Shortest Cord Possible)

Cord Lengths for 120 Volt Loads

If unit does not have GFCI receptacles, use GFCI-protected extension cord.

Current (Amperes)	Load (Watts)	Maximum Allowable Cord Length in ft (m) for Conductor Size (AWG)*					
		4	6	8	10	12	14
5	600			350 (106)	225 (68)	137 (42)	100 (30)
7	840		400 (122)	250 (76)	150 (46)	100 (30)	62 (19)
10	1200	400 (122)	275 (84)	175 (53)	112 (34)	62 (19)	50 (15)
15	1800	300 (91)	175 (53)	112 (34)	75 (23)	37 (11)	30 (9)
20	2400	225 (68)	137 (42)	87 (26)	50 (15)	30 (9)	
25	3000	175 (53)	112 (34)	62 (19)	37 (11)		
30	3600	150 (46)	87 (26)	50 (15)	37 (11)		
35	4200	125 (38)	75 (23)	50 (15)			
40	4800	112 (34)	62 (19)	37 (11)			
45	5400	100 (30)	62 (19)				
50	6000	87 (26)	50 (15)				

*Conductor size is based on maximum 2% voltage drop

Cord Lengths for 240 Volt Loads

If unit does not have GFCI receptacles, use GFCI-protected extension cord.

Current (Amperes)	Load (Watts)	Maximum Allowable Cord Length in ft (m) for Conductor Size (AWG)*					
		4	6	8	10	12	14
5	1200			700 (213)	450 (137)	225 (84)	200 (61)
7	1680		800 (244)	500 (152)	300 (91)	200 (61)	125 (38)
10	2400	800 (244)	550 (168)	350 (107)	225 (69)	125 (38)	100 (31)
15	3600	600 (183)	350 (107)	225 (69)	150 (46)	75 (23)	60 (18)
20	4800	450 (137)	275 (84)	175 (53)	100 (31)	60 (18)	
25	6000	350 (107)	225 (69)	125 (38)	75 (23)		
30	7000	300 (91)	175 (53)	100 (31)	75 (23)		
35	8400	250 (76)	150 (46)	100 (31)			
40	9600	225 (69)	125 (38)	75 (23)			
45	10,800	200 (61)	125 (38)				
50	12,000	175 (53)	100 (31)				

*Conductor size is based on maximum 2% voltage drop

Notes

Notes

Warranty Questions?

Call
1-800-4-A-MILLER
for your local
Miller distributor.

Your distributor also gives you ...

Service
You always get the fast, reliable response you need. Most replacement parts can be in your hands in 24 hours.

Support
Need fast answers to the tough welding questions? Contact your distributor. The expertise of the distributor and Miller is there to help you, every step of the way.

Miller

TRUE BLUE® WARRANTY

Effective January 1, 2010
(Equipment with a serial number preface of MA or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the delivery date of the equipment to the original end-user purchaser, and not to exceed one year after the equipment is shipped to a North American distributor or eighteen months after the equipment is shipped to an International distributor.

1. 5 Years Parts — 3 Years Labor
   * Original main power rectifiers only to include SCRs, diodes, and discrete rectifier modules
2. 3 Years — Parts and Labor
   * Engine Driven Welding Generators **(NOTE: Engines are warranted separately by the engine manufacturer.)**
   * Inverter Power Sources (Unless Otherwise Stated)
   * Plasma Arc Cutting Power Sources
   * Process Controllers
   * Semi-Automatic and Automatic Wire Feeders
   * Smith 30 Series Flowgauge and Flowmeter Regulators (No Labor)
   * Transformer/Rectifier Power Sources
   * Water Coolant Systems (Integrated)
3. 2 Years — Parts
   * Auto-Darkening Helmet Lenses (No Labor)
4. 1 Year — Parts and Labor Unless Specified
   * Automatic Motion Devices
   * CoolBelt and CoolBand Blower Unit (No Labor)
   * External Monitoring Equipment and Sensors
   * Field Options (NOTE: Field options are covered for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
   * Flowgauge and Flowmeter Regulators (No Labor)
   * RFCS Foot Controls (Except RFCS-RJ45)
   * Fume Extractors
   * HF Units
   * ICE Plasma Cutting Torches (No Labor)
   * Induction Heating Power Sources, Coolers, and Electronic Controls/Recorders
   * Load Banks
   * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
   * PAPR Blower Unit (No Labor)
   * Positioners and Controllers
   * Racks
   * Running Gear/Trailers
   * Spot Welders
   * Subarc Wire Drive Assemblies
   * Water Coolant Systems (Non-Integrated)
   * Weldcraft-Branded TIG Torches (No Labor)
   * Work Stations/Weld Tables (No Labor)
5. 6 Months — Parts
   * Batteries
   * Bernard Guns (No Labor)
   * Tregaskiss Guns (No Labor)
6. 90 Days — Parts
   * Accessory (Kits)
   * Canvas Covers
   * Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
   * M-Guns
   * MIG Guns and Subarc (SAW) Guns
   * Remote Controls and RFCS-RJ45
   * Replacement Parts (No labor)
   * Roughneck Guns
   * Spoolmate Spoolguns

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, relays, work station table tops and welding curtains, or parts that fail due to normal wear. (Exception: brushes and relays are covered on all engine-driven products.)**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

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Owner's Record

Please complete and retain with your personal records.

Model Name	Serial/Style Number
Purchase Date	(Date which equipment was delivered to original customer.)
Distributor	
Address	
City	
State	Zip

For Service

Contact a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:	Welding Supplies and Consumables Options and Accessories Personal Safety Equipment Service and Repair Replacement Parts Training (Schools, Videos, Books) Technical Manuals (Servicing Information and Parts) Circuit Diagrams Welding Process Handbooks To locate a Distributor or Service Agency visit www.millerwelds.com or call 1-800-4-A-Miller
Contact the Delivering Carrier to:	File a claim for loss or damage during shipment. For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.

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